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DESIGN THINKING AS A COMMON LANGUAGE BETWEEN
HIGHER EDUCATION AND EMPLOYERS

A Dissertation
Presented to
The Faculty in the Department of Educational Administration, Leadership, and Research
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
Of the Requirements for the Degree
Doctor of Education

By
Johnna Denning-Smith

December 2020

DESIGN THINKING AS A COMMON LANGUAGE BETWEEN
HIGHER EDUCATION AND EMPLOYERS

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I dedicate my dissertation work to my husband, Scott and children, Hank and Lily. Because of them I was able to pursue a lifelong goal. I missed many Saturdays, family parties, sports activities, and time in general to do this and they never complained. My husband has been the most generous and supportive person, picking up the slack, and talking me through many stressful moments. I will never be able to repay them all for their support.

I dedicate this dissertation to my Grandpa Bittner with whom I shared a special bond. Through his belief in me, there was never a doubt that I would attend college, even though I would be the first in my family to do so. I hope I have made him proud. I also dedicate this work to my family and friends, Mom, Steve, Chris, Amy, Dee, Barb, Mary, Grandma Phillips, Marissa, and Holly.

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This qualitative study explores student skill preparedness for the work force through semi-structured interviews and focus groups with current college students, faculty members, and employers. Responses from study participants were transcribed, coded, and thematically organized into the following four categories of skills that employers seek in recent college graduates: critical thinking skills, resiliency, workplace skills, and discipline specific skills. The findings include participant perceptions of the importance of these skills and whether higher education effectively prepares recent graduates for the workforce. As part of this discussion, design thinking is presented as a bridge between these groups and as a solution for the problem of workforce preparedness of recent graduates.

INTRODUCTION

Decades of increasing college enrollment, coupled with an aging workforce, places consistent pressure on higher education to meet the needs of the labor market and the student body. The rising cost of a four-year degree places similar pressure on students entering these institutions to graduate in a timely manner and secure employment immediately upon completion in a field commensurate with their degree level and subject area. Federal and state governments act as both a funding source and overseer of this system, seeking to bridge the gap between what the labor market demands and what higher education can supply.

In response to these factors, higher education policy initiatives focus on the employability of students upon graduation. The Commission for Higher Education in Indiana (2016) highlights two goals in its *Reaching Higher, Delivering Value Report*, which quantifies and assesses the skills students learn while pursuing a degree. Career integration is incorporated as a core competency measure in all degree programs. A guiding principle of the commission in shaping the future of higher education in Indiana is work force alignment, specifically “recognizing the increasing knowledge, skills, and degree attainment needed for lifetime employment and ensuring Indiana’s economic competitiveness” (p. 7). Kentucky’s equivalent, the Council on Post-Secondary Education (2018), seeks to “strengthen the workforce, economy and quality of life by guiding the continuous improvement and efficient operation of a high-quality, diverse, and accessible system of post-secondary education” (p. 2). The Ohio Department of Education (2016) has focused their policy initiatives toward competency-based education

(CBE) by setting goals to establish a network of Ohio colleges that have adopted the CBE model, review legislation to remove barriers to CBE, develop evaluation tools to measure the success of CBE in Ohio, and encouraging students to enroll in CBE programs through marketing strategies. These factors contributed to the changing landscape of higher education in the past decade. Instead of Humboldt and Newton's (as cited in Prokou, 2008) philosophy of knowledge and cultural enrichment being the true goals of higher education, the current reality is a market-oriented university system where graduates expect to possess the corresponding skills in demand by industry. O'Leary (2013) supports this expectation in a survey of prospective graduates where 84% of respondents felt employability should be the end goal of undergraduate degree programs.

Approximately 60% of students believed this goal should be managed formally through the program, not as a by-product of participation. Management, in this case, takes the form of industry collaboration with classroom learning or dedicated internships with students reporting higher levels of self-efficacy when entering the job market. Many studies attempt to quantify those employment skills into an agreed-upon language shared between higher education and industry. The diverse and dynamic nature of employers requires graduates who possess not only a wide range of soft and hard skills but also attributes that translate across industries, such as communication, critical thinking, teamwork, resiliency, empathy, flexibility, and time management.

Purpose of this Study

The purpose of this study is to explore the gap between skills learned in higher education and skills desired by employers. The qualitative research examines whether *design thinking* could be the common language between both entities. Design thinking is

a process used to solve complex problems and it begins through empathizing with users and their needs. As the first stage of the design thinking process, empathy involves the development of understanding of a population that may include customers, students, employees, or clients. Included in this stage is the effort to learn the motivations and feelings experienced by users as they utilize products and services. The second stage requires design thinkers to define problems related to that user experience, the work to create a problem statement that kickstarts the ideation stage. Ideation as the third stage in the process involves collaborative brainstorming to solve the problem, while incorporating user empathy. This stage incorporates team ideas and feedback with the hope that the best solution will emerge for the user. Prototyping as the fourth stage involves the creation of products, the improvement on pre-existing products or services, or actionable solutions to more abstract problems. Regardless of the prototype or the problem being addressed, it is required in the design thinking process that solutions must be tested for the purposes of obtaining feedback from users. During the final testing stage, this feedback will be used to improve on the possible solution to provide the user with the best experience. After this stage of the design thinking process, a solution can be implemented or returned to varying stages of the process for refinement. The end goal of the design thinking process is to create the best solution for the user using collaboration, critical thinking, and testing.

Although higher education and employers emphasize core curriculum and skill competency, respectively, neither can solidify which skill set translate best from the classroom to the workplace. The only constant is that employers must draw from a hiring pool of recent college graduates to defray training and education costs, while also

obtaining a workforce with desirable skill set. Unsuccessful attempts to align those skills between higher education and employers leaves graduates in a state of limbo as they attempt to begin a career. The incorporation of design thinking into higher education curricula could provide students an opportunity to develop a mix of skills throughout their educational career leading to increased adaptability and employability across varying fields.

Need for this Study

Barrie (2006) states “The increased public investment in universities has brought with it demands for universities, as public institutions, to demonstrate that they are efficiently and effectively achieving what are deemed to be relevant and worthwhile outcomes” (p. 216). Since the publication of Barrie (2006), public investment has continued to evolve away from higher education operations being part of government line items, but instead, it has become the recipient of low-income student grant awards and a subsidized student loan industry. The cost of public higher education no longer falls directly on state and federal but instead is shouldered by graduates and their families. The demand for degrees from higher education institutions has continued to grow as employers continue to demonstrate the need for a workforce with post-secondary education. Due to this shift toward market principles governing higher education, the relationship between students and institutions has evolved into that of customers and retailers. This evolution has been met with calls to ensure the quality of product from higher education as they continue to increase tuition.

According to the National Center for Education Statistics (2018), undergraduate enrollment increased by 28% and is expected to increase by 17.4 million students by

2027. As enrollment has increased, so too has tuition at both public and private institutions. Between 1987 and 2017, the inflation adjusted average tuition for four-year public schools grew from \$3,190 to \$9,970, respectively. During the same time, the inflation adjusted average tuition for four-year private schools grew from \$15,160 to \$34,740, respectively (College Board, 2017). As a result of rising tuition costs and the emphasis on higher education as means to gain employment, approximately 40% of adults aged 18-29 have student loan debt. The median debt amount of those with student loan debt is \$25,000 for undergraduate degrees and \$45,000 for graduate degrees (Cilluffo, 2017). The combination of higher education as a requirement, rising tuition, and student debt certainty places an emphasis on higher education ensuring the employability of its graduates and guaranteed employment post-graduation.

Bridging the Gap

The application of design thinking in higher education has the potential to bridge the gap that exists between institutions and employers. Skills such as teamwork, critical thinking, empathy, resiliency, and communication are all inherent in the design thinking process and can be easily integrated at the classroom level within the higher education system. By incorporating design thinking into the classroom, instructors are motivated to move away from traditional teaching and assessment methods (e.g., lectures and standardized testing) by serving as a guide for students in solving complex problems. These complex problems are often derived in partnership with community businesses and organizations that provide experiential learning opportunities to students. Students approach this process in teams or small groups to develop creative solutions, then oversee the testing and implementation of their solutions with guidance from faculty and

community stakeholders. Applying design thinking at the administrative level promotes university-wide problem solving with diverse members of the campus community. By incorporating design thinking into the classroom, students are prompted to utilize and develop the same skills employers demand from recent graduates, while also gaining experiential learning opportunities in diverse fields of study.

Summary of Chapters

Chapter One introduced the interrelationship among higher education, industry, and government, as well as a discussion of the purpose of this study as it relates to these entities and design thinking. Chapter Two provides a review of literature concerning design thinking as an interdisciplinary concept, its application in higher education, and its application in the business sector. Chapter Three discusses study methods to analyze student skills from the perspective of currently enrolled students, faculty across multiple disciplines, and industry representatives through semi-structured interviews. Chapter Four analyzes student, faculty, and employer interviews to establish conceptual and overarching themes to explore possible linkages between higher education outputs and the workforce needs of industry. The established themes are compared with design thinking concepts to align the goals of higher education and the needs of employers. Chapter Five consists of a discussion of study results, including application in higher education curriculum and program development, along with implications for future research and limitations of the current study.

REVIEW OF THE LITERATURE

Soft Skills by Definition

The skills universities aspire to develop in their student body encapsulate both “hard” and “soft” skills. Hard skills are defined as an individual’s technical ability to perform certain tasks specific to the field of study or business sector. While a consensus of soft skills definition remains a disputed concept, there is a wealth of scholarly research on the topic. Robles (2012) defines soft skills as being personal attributes such as social skills within groups that can be developed over time. Cleary, Flynn, and Thomasson (2006) specify that soft skills include critical thinking skills, business skills such as innovation or entrepreneurship, civic mindedness, interpersonal skills such as teamwork, and personality skills such as self-confidence and responsibility. Perrault (2006) defines soft skills as “traits and capabilities that an individual possesses in addition to the individual’s technical and/or knowledge skill set” (p. 1). Blaszczyński and Green (2012) go on to provide examples of these traits such as public speaking ability, writing, listening, teamwork, time management, and problem solving. Similarly, Botha and Coetzee (2017) expanded their list of soft skills or “employability attributes” to career self-management, cultural competence, self-efficacy, career resilience, sociability, entrepreneurial orientation, proactivity, and emotional literacy.

Though the concept of soft skills remains difficult to define, studies continue to highlight their importance to executives, hiring managers, and the work force, benefitting the latter through initial employability and career mobility (Barrie, 2006; Botha & Coetzee, 2017; Collet, Hine, & Plessis, 2014; Griffin, Cangelosi, & Hargis, 2014; Pool & Sewell, 2007; Robles, 2012; Vyas & Chauhan, 2015).

Importance of Soft Skills

Less complex is the conclusion that graduates entering the workforce require more than job skill training related to their desired career field. These hard skills may indicate a graduate's ability to perform specialized tasks but do little to indicate how, as an employee, they will manage organizational change, collaborative projects, or decision making. As identified by Botha and Coetzee (2017), employability attributes demonstrate positive effects on job performance measures, career prospects, and career outcomes.

Charoensap-Kelly, Broussard, Lindsly, and Troy (2016) found that employees participating in soft skills training offered through an employer demonstrated an improvement in their work environment through empathically relating with co-workers, utilizing effective communication skills, and developing collaborative partnerships.

Career advancement within organizations is oftentimes related to the employee's proficiency at both hard and soft skills. Eagerness and capability to collaborate positively with others results in upward mobility and success in managerial positions (Robles, 2012). Andreas (2018) equates soft skills to the development of human capital (i.e., aspects of an employee beneficial to the employer such as knowledge, habits, and skills), which allows individuals to build capacity and utilize an available skillset in the workplace such as communication. This skill translates into valuable capital, e.g., leadership, team building, collaboration, within the organizational environment. Furthermore, Andreas (2018) argues that improving soft skills develops human capital in graduates and creates more engaged community members. These individuals are more likely to possess expanded social networks, experience positive community relationships, and engage in volunteer activities.

Hart Research Associates (2015) surveyed employer expectations of college student preparedness and found that 85% of employers believe broad learning outcomes (e.g., problem solving with people possessing different views, civic capacity, liberal arts and sciences, and intercultural skills) or a mixture of field specific and broad outcomes are beneficial for college students attempting to gain employment in their industry. Survey respondents placed a higher significance on communication skills, teamwork, ethical decision making, critical thinking, and real-world knowledge of post-graduate college students. Proficiency in these skills is related not only to gaining employment but success within their specific industry segment (Hart Research Associates, 2015).

Miscommunication between Higher Education and Industry

Regardless of the umbrella term used to describe skillsets outside of those related to a specific discipline (i.e., soft skills, 21st century skills, cross-cutting skills, traits, attributes, etc.), the difficulty lies in how these skills are integrated into the classroom, how they are assessed, and how they meet the demands of potential employers. When hard skills are tied to a specific job, the potential employee either possesses those skills with a certain level of competency or they do not. Those skills are obtained through formal education and training via an employer or university. Conversely, soft skills remain more difficult to quantify or provide demonstrable competency, becoming a catch-all for both institutions. Essentially, if there is not a corresponding learning outcome or competency, then it must be a soft skill.

Through semi-structured interviews with 30 graduates from business schools and 20 employers across four countries, Andrews and Higson (2008) highlight this soft skill definition diversity by using soft skills as an umbrella term to encompass

professionalism, reliability, adaptability, ability to work under pressure, strategic planning and thinking, written and verbal communication, teamwork, networking, information technology skills, creativity, self-confidence, self-management, time-management, continued learning and ownership of responsibility. Griffin, Cangelosi, and Hargis (2014) showed soft skills ranked higher than hard skills when considering level of importance to employers in a survey of 244 students at the University of Central Arkansas. Of the participants, 192 were female and 52 were male with an age range between 19-30. Both undergraduate and graduate students were represented from health sciences, business, natural sciences, mathematics, education, liberal arts, fine arts and communication. Respondents believed dependability, dedication, work ethic, integrity, loyalty and job satisfaction were identified as valuable soft skills to potential employers. It is questionable whether those skills should be categorized along with other soft skills such as communication, relationship building and problem solving, as many in the former group are dependent on intrinsic motivations and psychological factors, many of which are influenced less by curriculum in higher education and more by the organizational environment of the company.

In an evaluation of interview responses on performance outcomes (e.g., customer satisfaction, financial performance, and employee job satisfaction) from employees within 52 retail banking centers, Brown and Mitchell (1993) support this assumption that a relationship exists between organizational obstacles and employee satisfaction and intrinsic motivation. Specifically, as obstacles are removed, employee satisfaction increases, along with customer service and organizational performance.

In 2014, the Association of American Colleges and Universities commissioned a study by Hart (2015) to conduct an online survey of 400 employers with more than 25 employees and a minimum of 25% of their workforce possessing at least a two-year degree. Both the private and non-profit sector, encompassing business owners, CEOs, presidents, C-suite level executives, and vice presidents responded to the study. As a follow up, another online survey was conducted of 613 college students with 455 representing four-year institutions and 158 representing community college students. According to this study of learning outcomes important to career success and recent graduate competency levels in these areas, 88% of employers felt it was important for higher education to prepare students with the skills and knowledge necessary to complete an applied learning project, with 73% believing that students should have already completed an applied project prior to graduation. These applied learning projects would not only improve learning, but also better prepare students for success in their given career. While a large percentage of respondents endorsed this type of applied learning style, only 14% believed college students possessed the skills necessary to complete an applied project. Employer respondents were also more likely to report needed improvements in higher education regarding student preparedness compared to college students.

College student respondents in the same study agreed with employer respondents that cross-cutting skills such as communication, teamwork, decision making, and critical thinking rated higher than other learning outcomes. There was agreement on the importance of experiential and applied learning to career success as well. The disconnect between groups is evident in their assessment of college performance in ensuring

graduates possess these skills and experiences. Only 26% of students believed colleges could improve their graduate preparation for entry-level positions compared to 58% of employers, and in college preparation for advancement/promotion, 36% of students believed colleges could help as opposed to 64% of employers. Students also rated themselves higher on all 16 items of a learning outcomes scale related to employment preparedness (teamwork, decision making, communication, critical thinking, technology proficiency, evaluating information, statistics, innovation, complex problem solving, applied knowledge, cultural awareness, staying current on scientific breakthroughs, working with people of differing backgrounds, informed on current events, second language proficiency, global awareness/experience) compared to employers who were asked to assess recent college graduates on the same scale (Hart Research Associates, 2015). The issue highlighted in these results, regardless of alignment between students and employers on skills related to success, is a disconnect in student perceptions versus employer perceptions regarding the success of higher education in instilling those skills. A disconnect also emerges between student self-assessment related to their skill proficiency, which is overly optimistic compared to what employers are observing from recent graduates in their workforce.

The complexity of the learning outcomes, skills, and attributes employers want in recent graduates, as well as the ability of higher education to accommodate those expectations, is the principle shortcoming in the relationship between two entities that have grown mutually dependent. Finding a common language between higher education and employers could be accomplished by narrowing the scope of soft skills into a manageable concept such as design thinking. Design thinking is multidisciplinary and

empirically supported, both theoretically and practically. It can be incorporated into the higher education classroom due to its interdisciplinary nature and provide graduates with a background in creative problem solving, aligning them with liberal arts traditions of universities and the demands of employers. The design thinking concept could be utilized to achieve broad and applied learning outcomes in the higher education environment.

Design Thinking

Design thinking is a philosophy and practice rooted in the engineering fields where engineers are presented with real-world problems, then design and implement human-centric solutions. Over the past decade, design thinking transitioned into the management field, as many of its key concepts and history align with the creation of products.

Johansson-Skoldberg, Woodilla and Centikaya (2013) describe design thinking elements through its frequent adaptation across disciplines in the last 50 years. These elements include the creation of artifacts, reflexive practice, problem solving, a method of reasoning, and creation of meaning. Originally described by Herbert Simon, a Nobel Prize winning economist whose theory of bounded rationality served as a precursor to artificial intelligence, the creation of artifacts was an aspect of design thinking that allowed for differentiation away from natural sciences, as they are only concerned with studying and addressing that which currently exists. In the engineering field, there is a delineation between design thinking and the scientific method, where practitioners of the scientific method (e.g., observation, question, hypothesis, testing, analysis, conclusion, comparison to hypothesis, reporting) are constrained by observation of that which already exists. As Simon (1996) states, engineers are tasked with designing and creating

something that did not previously exist. Simon (1996) goes on to include professions such as architecture, business, education, law, and medicine as design themed fields, receiving this designation separate from the "hard sciences" due to their application of creative problem solving in a pre-existing environment where change is a desired outcome. This primary aspect of the design thinking process was developed over time to include any discipline where something new was created and became one of the key steps of the process labelled “prototyping” by Stanford University.

Reflexive practice became incorporated into the process through the works of Donald Schon, an M.I.T philosopher specializing in urban planning and critic of Simon’s application of design thinking, incorporated the idea of problem solving through testing and re-testing solutions. Schon (1983) described the reflection and redesign aspects of design thinking as those most common in everyday life. While design thinking originated as a problem-solving tool for business and technological advancement, its practical application as a human learning experience helped develop its multi-disciplinary appeal. According to Schon (1987), practitioners are more likely to understand how to react during situations requiring problem-solving skills. Schon (1983) included management as a profession where “reflection in action” is applied daily by those in leadership roles. The manager relies on experience and situational adaptation to problem solve multiple issues which arise in the organizational environment, including supply chain disruption, human resource issues, and interpersonal communication among employees and leadership. This step allowed design thinking to evolve from cognitive exercises to a practical process, incorporated into the “testing” and “assessing” phases of modern design thinking.

Richard Buchanan would incorporate the problem-solving aspect into the design thinking process through his works on problem definition and possible solutions using design theory. Prior to this, design thinking was a process of creation for the sake of creation with minimal practical, multidisciplinary implications, but through his work, design thinking expanded into communication, technology, and the organizational environment. The incorporation of the liberal arts into the design thinking process assists the user in mining information from varying disciplines for the purpose of more creative problem solving (Buchanan, 1992). The underlying theory is that these disciplines and humanity are interconnected in both their problems and solutions. Buchanan (1992) goes on to highlight that many of these liberal arts disciplines originally sought to gain a greater understanding of the world and its interconnectedness but have since narrowed their focus while embracing a practical application of their subject matter. Design thinking developed into a natural fit for the social sciences as many societal problems are complex and multifaceted. To effectively address these issues, a problem-solving approach must be implemented that is equally adaptable and requires input from the numerous parties involved in addressing social issues. The design thinking process currently incorporates Buchanan's work into the "define" and "ideate" stages of the process where problems are clearly defined, and brainstorming occurs to arrive at possible solutions.

Lastly, the methods of reasoning and creation of meaning in design thinking evolved as researchers began studying how designers approached problems and the importance of innovation in that process. The work of Lawson, Cross, and Krippendorff as cited by Skoldberg et al. (2013) sought to turn design thinking into a repeatable

process that was purposeful in that at its conclusion, innovation on existing products, services, or processes would result.

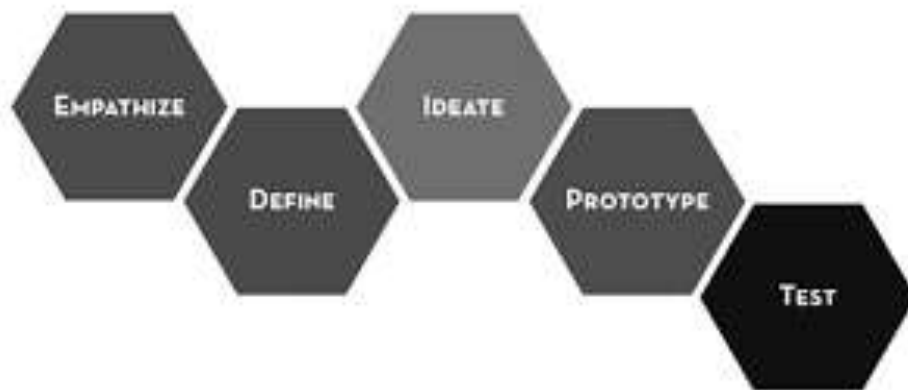
While the process of design thinking varies by discipline and application, Razzouk and Shute (2012) identified experimentation, creation or prototyping, feedback, and redesign as aspects of design thinking originally related to engineering. Design thinking serves as not simply a creative process focused on the outcomes of engineering and technology fields, though. Many companies have translated the process into a general problem-solving philosophy utilized across departments. Brown (2008) described variation in design thinking where the process encompasses empathy, integrative thinking, optimism, and collaboration. This allows companies to not only focus on product design but also understand their customer base and adapt their business model to better serve that population. Simon's (1996) original model of the design thinking process, define, research, ideate, prototype, choose, implement and learn, has spawned variations which have since been customized for use in professions outside of tech fields. The Hasso Plattner Institute of Design has incorporated Simon's research into the basis of a renowned educational program aptly named "d.School," where they instruct students using the slimmed down design process "Empathy, Define, Ideate, Prototype, Test." The conclusions of Simon (1996), Brown (2008) and Razzouk and Shute (2012) are supported by Lammi and Becker (2013) and Mentzer (2014) who found that pre-engineering students presented with a problem-solving activity utilized similar design processes. The Lammi and Becker (2013) study demonstrated activities such as evaluating multiple interconnected variables, the open-ended nature of problem solving, and optimization of the final product. These characteristics mirror empathy/definition, creation/prototyping,

and test/redesign, respectively. The students in the Mentzer (2014) study demonstrated activities such as information gathering, modeling/communicating, and feasibility, which include aspects of the previously cited theories.

As evidenced by the developmental history of design thinking, the process is not attributable to only one discipline, definition, or purpose. The Hasso-Plattner Institute of Design at Stanford University offers the clearest and commonly used descriptions of the process (See Figure 1).

Figure 1

Stanford d.School Design Thinking Process



Buchanan (1992) highlights the importance of design thinking as an integrative process and one that facilitates input from diverse professions and academic disciplines. Practitioners of disciplines which employ the scientific method often consider design thinking as the application of their discipline, but in doing so, restrict the process to only one field. According to Brown and Katz (2011), design thinking is increasingly utilized by interdisciplinary teams to solve diverse problems related to pediatric obesity, climate change, and crime prevention, demonstrating its application outside of traditional design

organizations. Design thinking as a philosophy or practice is better categorized as one which incorporates all disciplines for the purpose of creative problem solving. The primary strength of design thinking is the malleability of its definition and process, resulting in its employment by diverse practitioners.

Design Thinking in Management and Leadership

Management and leadership serve as natural disciplines for the evolution of design thinking with traditionally complex organizational environments and highly competitive industries requiring adaptation to survive. Dufour and Steane (2014) hypothesize that organizations experience decline due to a lack of creative, strategic methods of thought, and problem solving. The authors identify four leadership/management styles indicative of design thinking processes including entrepreneurial innovation, organizational awareness, competition differentiation, and adaptability. Organizational leaders embody these traits through efforts to create new or change current industries, reinvent current business strategies, become increasingly efficient and effective, and obtain new positions discernable from their competition.

Goldman (2012) found an increased need for strategic thinking within organizational cultures. By studying over 400 executives at a strategic thinking conference, Goldman created a Likert survey to assess the utilization of strategic thinking by executives and managers in attendance at conferences dedicated to the topic. It was discovered that attendees minimally incorporate the practice into the organizational culture with about 30% using it “half the time.” Contrary to the belief that organizational cultures rely on strategic thinking, there was a lack of variability in strategic thinking utilization from conference to conference over the course of the year. Participants cited

two rationales for the stability of this measure; the first never received formal training on the implementation strategic thought in the organizational environment, and the second evidenced a lack of understanding in the difference between strategic thought versus planning.

To better understand how organizations were utilizing design thinking, Liedtka (2014) conducted interviews of organizational leaders of a sample of *Fortune 100* companies to determine how these organizations were incorporating design thinking into their operations. Upon completion of these interviews, Suncorp, SAP, Toyota, 3M, IBM, MeYouHealth, and Intuit were studied further to understand how design thinking evolved in these companies from simply a tool for innovation into an organizational problem-solving process.

Suncorp, SAP, Toyota, 3M, IBM, MeYouHealth, and Intuit case studies have revealed these companies utilized design thinking to address internal organizational issues, including skill building and leadership development, as well as improved relationships between the corporation and customers (Liedtka, 2014). Suncorp utilized design thinking to assist with the integration process upon completion of a merger by promoting strategic conversations across divisions and multiple levels of the organizational hierarchy, resulting in a company-wide alignment of strategy and vision. SAP developed new communication tools and strategic planning around the complex Web 2.0 concept. Toyota conducted an analysis and rebuilt a west coast call center by creating horizontal leadership and decision-making strategies with the goal of improving customer and employee experiences with the company. By creating teams that included frontline call representatives, software designers, business leaders, and change agents, the

organizational environment was improved for both employee and customer. 3M utilized design thinking strategies such as ethnography and visualization to assist their sales team in marketing new products outside of the standard technical description methods commonly employed by their competitors. IBM also improved their customer marketing through the study of human interactions, ensuring trade shows became more interactive for the consumer of their products. To accomplish this, the design team conducted prototyping and testing with real customers (both steps in the design thinking process) to demonstrate the success of this new strategy.

MeYouHealth and Intuit were two organizations that utilized design thinking as a tool to improve management and individual self-improvement. MeYouHealth partnered with the larger Healthways Company to develop social media strategies geared toward improving healthy lifestyles in service users by incorporating the qualitative nature of design thinking. Intuit promoted design thinking in a much larger capacity by training and motivating all employees within their organizational structure to think creatively and incorporate “customer delight” or empathy into this creative process, resulting in increased customer value (Liedtka, 2014).

As posited by Simon (1996) and expanded on by Schon (1983), design thinking is evident in the large-scale company and/or industry perspective of innovation, leadership, and customer service. Design thinking effects ripple through organizational subsets, developing and reshaping the internal culture as well. For example, in problem solving within an organizational environment, teams or work groups often attempt collaboration with the unintended outcome being a solution which no one endorses nor dislikes to a significant degree. Failed collaboration oftentimes is the result of an ill-defined process to

guide the effort, unequal power dynamics within the group, goal uncertainty, role obscurity, and a general unawareness of group strengths and weakness (Huggett, 2018). When groups compromise on a solution, it often limits the ability of the participants to work through their differences in opinion. Participants accept the least agreeable solution, instead of one which may better address the problem or benefit the company (Simon, 1969).

Design thinking promotes the utilization of these differences within the group structure into the decision-making process, while reaching a consensus on the issue being addressed and future possibilities before engaging in any significant problem-solving efforts. The groups who engage in the process are often multi-disciplinary or stratified across organizational segments. The facilitator is trained in the design thinking process, placing emphasis at the outset that the process is inclusive of all backgrounds, opinions, and ideas. The activities that precipitate the design thinking process are known as “stokes,” designed to get individuals from disparate backgrounds involved, communicative, participatory, accepting of failure, and egoless (Gardner, 2017). The establishment of design or solution-focused guidelines ensures the process is data driven, not opinion driven. Lastly, the ability to engage customers during the prototyping and experimentation process serves as motivation in the design thinking process and contributes to the body of usable data necessary to make meaningful change in order to achieve the best possible result (Liedtka, 2014). During the design thinking process, the customer is not theoretical, but instead actively engaged by the group in all stages. Problem identification, brainstorming, prototyping, testing, and re-testing are all

completed by empathizing with the customers who benefit from the solution and receiving real-time feedback from customers on improvements.

Burnette's (2016) case study of IBM highlights the steps necessary to implement organizational change across a large corporation. To train both new hires and current employees, IBM established a new hire boot camp and workshops for product teams. These initiatives provided design thinking education and implementation exercises within small group settings. Executive design days were established to ensure senior management was familiar with the new language and framework around design thinking. The IBM Design Thinking University allowed all employees to receive certification in design thinking for all employees, including those tasked with client relations, not simply internal processes. In addition to addressing training needs with current and potential employees, IBM marketed its new design-centered organization in recruiting recent graduates and utilized its human resource department in mapping career projections within the company for new designers, ensuring low attrition rates among its employees. Leadership philosophy was focused on allowing the design thinking process to occur with minimal inhibition by creating leaders who guide, instead of micro-manage. According to Burnette (2016), long-term planning for IBM's culture of design thinking involved the use of incubator programs that allowed teams to identify new user problems in need of solutions and the creation of a shared design language to allow all members of the organization to understand a similar language. Publication and socialization play key roles in employee acceptance of the design thinking culture with artifacts such as empathy maps and storyboards, creating an environment of understanding and planning. Brown and Katz (2011) describes this phenomenon as the evolution of design thinking,

where the concept has moved from product development divisions to company-wide initiatives. Design thinking applications within companies, such as IBM, is no longer restricted to introducing physical products but are “developing new processes, services, interactions, entertainment forms, and ways of communicating and collaborating” (Brown & Katz, 2011, p. 381). Publication of IBM design thinking processes, language, and research for use by other companies and customers allows for the existence of a commonality among those participating in this business sector. This company initiative motivates all participants to innovate and collaborate within their own environment, utilizing IBM as a resource for organizational change.

Design Thinking Education

The introduction of design thinking in the classroom is rooted in Schon's developed philosophy. According to Schon (1983), design thinking can be taught, but it requires an applied learning environment different from those where instructors lecture or educate from texts. He believed higher education should focus less on technical proficiency or discipline-specific knowledge and more on applied learning or “learned practice,” He explained the scientific method as not applicable to all fields and that design inquiry should guide disciplines attempting to solve practical problems in fields that incorporate design. Schon believed design-based thinking should be incorporated into secondary, general education curriculum, which would allow higher education to dedicate its efforts toward the professional training of its student body. It also requires the inclusion of multiple perspectives and aspects surrounding a problem, making it impossible to practice design thinking in isolation. Lastly, design thinking education should teach students to recognize both positives and negatives related to the

development of solutions using design. Waks (2001), using Schon's philosophy, identifies tasks specific to the instruction of design thinking, as well. The instructor must address the problems encountered during the design education process while allowing students to reach their own solutions. The instructor must customize the learning process to the skills possessed by learner and maintain a level of adaptability like the material being taught. The instructor must also develop a relationship with the students and be capable of assisting them through a difficult learning process where failure and dependence on instructor knowledge are certainties.

In Lloyd's (2012) study of the Open University design thinking course, many of Schon's theories were operationalized to varying degrees of success. The course matched distance education students with regional tutors who supported them through the completion of design-centered projects. Upon completion of the first project, 118 students were surveyed about their experience with the course. The results yielded that 70.7% of students reported satisfaction with the quality of the course, and 72.4% reported satisfaction with their study experience. Difficulties with collaboration in group activities and technical issues related to distance education software were identified as contributors to lower student satisfaction measures compared to other Open University courses. Also contributing to the lower survey results was the high proportion of students who had taken other classes from Open University and were unprepared for the digital format change of the design course.

While the student perceptions of the design thinking course were lower, Schon's theory of instructor-student relationships was demonstrated using tutors specific to design thinking students where 82.1% of students reported satisfaction with the level of support

received from their tutor. A survey of 16 tutors highlighted the positive outcomes of this innovative program including course structure and practical content with 86.4% of respondents describing satisfaction with the practical nature of the course content. Evaluation of retention rates further supported Schon's theory of the importance of student-instructor relationships in the design thinking process where new tutors who were active in the design field demonstrated higher retention rates (70.5%) compared to existing tutors (55.5%) (Lloyd, 2012).

The educational environment over the last decade has experienced significant change, affecting all disciplines, including those most affiliated with design education. In the past, instructors in these disciplines would transmit information in a classroom setting where students would then apply this knowledge under supervision. Recently, the focus on measurable learning outcomes through assessment has supplanted creative assessment methods related to experiential learning. This, along with efforts for student to specialize in a certain discipline early in their academic career, results in a siloed student body, contained within their own discipline that may not support creative thinking to the level of design-based courses. Orthel (2015) highlights design thinking education as a traditionally studio-based concept where design is explicit in the curriculum (e.g., interior design), but also covers a wide range of disciplines where students learn to think and act to solve problems (e.g., engineering, health care, psychology, astronomy, business, mathematics). Studio-based courses are most capable of implementing design thinking as an actionable skill, but the creative problem solving inherent in design thinking stretches across traditional disciplines.

Specific disciplines, such as entrepreneurship, are experimenting with the utilization of design thinking in the classroom. Nielsen and Stovang (2015) have identified shortcomings in both learning material and the classroom environment. The former tends to focus heavily on the organizational and managerial process after product development, instead of the process of product creation and testing. The latter incorporates the instructor as the purveyor of information through natural classroom design, where student desks are lined up facing the front, not one another. The setup, while standard in college classrooms, is not conducive to a free exchange of ideas and creative thought necessary for design thinking in entrepreneurship education. Their solution to these issues is the Design University (DesUni) model, described as the integration of design thinking principles into the traditional entrepreneurship classroom in a way that changes faculty/student interaction, curriculum, knowledge gained, and course assessments. The curriculum includes aspects of the design thinking process and tools used during that process such as user mapping, personas, visualization, co-creation, prototyping, and brainstorming. The use of facilitation, shared learning, teamwork, and social interaction in the classroom environment promotes interdisciplinary learning, bringing together students from differing backgrounds, experiences, and educations. The instructor serves as a guide through the DesUni model, like how a facilitator would work with a team engaged in the design thinking process. The instructor creates the environment for problem solving by creating a classroom conducive to the design thinking process and by utilizing external and internal stakeholders to assist students through an applied learning experience. The assessment of these applied learning

activities is different to traditional classroom assessments as well, incorporating peer reviews, journals/log books, and portfolios.

Daniel (2016) completed a similar analysis of a new undergraduate entrepreneurship course that incorporated design thinking into its teaching methodology. The course included a multi-disciplinary group of 66 students from industrial engineering/management, economics, languages and business relations, biology, and management. The course was divided into three stages with the first serving as a primer on principles of entrepreneurship. The second stage focused primarily on classroom activities where teams of students incorporated research and brainstorming based on their diverse backgrounds and experiences. The last stage allowed students to apply what was learned in the previous two stages toward prototyping solutions and creating business plans from those solutions. Like Daniel's program of study, Lake, Ricco, and Whipps (2016) completed a case study analysis of an adult learning program in leadership utilizing design thinking. This analysis included a survey of student experiences, student-led feedback sessions, and an appraisal of student projects at the conclusion of the program. Student participants reported an increase in their leadership knowledge and ability, along with an increase in their comfort level in implementing leadership skills in the workplace. Student participants' self-efficacy in promoting positive organizational change through leadership skills increased from 48% to 78% at the conclusion of the program. Students referenced the design thinking process as responsible for improving their skills in leadership, team building, reflection, creativity, initiative, and empathy.

Lloyd (2012), Nielsen and Stovang (2015), Daniel (2016), and Lake et al. (2016) all exhibit programs that have incorporated design thinking principles into higher

education courses and represent a departure from traditional learning methodologies present in the traditional college classroom. These examples demonstrate the possibility of evolution in the higher education classroom, where students are encouraged to possess a liberal arts or multi-disciplinary educational experience, as it is shown to be a benefit in the classroom and beyond. The skills utilized in design thinking classrooms, such as teamwork, creative problem-solving, and communication, are often listed as desirable by employers seeking to hire recent college graduates. Lastly, the applied learning evident in these courses provides experience beneficial to the preparation of students as they enter workplaces with similar expectations.

Benefits of Design Thinking Education

Design education has been demonstrated as an effective curriculum tool across multiple disciplines and grade levels. In a study by Kelley and Sung (2017), 66 fifth-grade classroom sessions were analyzed across six classrooms at two school sites. These sessions utilized the concurrent thinking aloud (CTA) protocol to learn how students work through problem-solving activities that incorporate design thinking into engineering activities. Students were directed to explain their thoughts related to problem solving and utilize their prior knowledge from classroom-based design activities; then researchers coded their responses using a transcription software. Performance on the design-based activities were then compared to the data from the CTA. They found that students increased the amount of time on computational thinking by 34% when given a math embedded design task. Students also demonstrated increased conceptual knowledge in science after completing the activities. A longitudinal study of third through sixth graders at an all-girls private school participating in STEM classes appraised learning with a

focus on design, inquiry, inferential reasoning, representational skills, and STEM conceptual development (English, 2019). The 34 student participants demonstrated novice-level learning that began with knowledge of the design process but then evolved over the course of the program to include advanced skills such as reconstructing problems and redesigning solutions. While students developed skills related to design thinking, they also increased their conceptual knowledge of STEM related fields. These findings demonstrate that the incorporation of design thinking into the classroom not only builds 21st century skills inherent in the design thinking process, but also increases the depth of knowledge related to formal course topics (e.g., science, mathematics, engineering, technology).

Shively and Palilonis (2018) implemented design thinking workshops with 40 elementary education students at a small, midwestern university to determine the effectiveness of design thinking as a learning strategy in the higher education classroom. The participants were tasked with developing a digital literacy curriculum while participating in the workshops and then responded to a survey measuring their satisfaction with the learning experience. All 40 students participated in the design thinking workshops where they focused on empathizing with teachers and kindergarten through third grade students on their interests in utilizing digital texts. Participants also brainstormed scenarios that may occur between elementary students and teachers, prototyped lesson plans, tested those lessons, and received feedback from teachers. Twenty-nine of the students who participated in the workshops completed surveys regarding their experience. This resulted in 72% of participants not having a clear, conceptual understanding of digital literacy prior to the workshops, but understanding

improved as design thinking was integrated into instruction and development of a digital literacy curriculum. There were 97% of the participants who reported that participating in the design thinking workshops improved their comfort level in teaching digital literacy; another 90% of participants described design thinking as a process they would use in the future when developing curriculum and/or use in the classroom setting with their students; and 74% of participants strongly agreed that design thinking gave them a deeper understanding of digital literacy as a curricular framework, regardless of their starting comfort level with the concept. These student data demonstrate that the integration of design thinking in the higher education classroom can result in a better understanding and application of content, along with increased confidence in a professional setting. An additional benefit of the design thinking process in the classroom that carries cross-discipline implications is Shively and Palilonis' (2018) description of initial interactions between elementary education students. Students were noticeably reluctant to share ideas during the start of the workshops, but after participating in design thinking exercises that focused on collaboration and brainstorming, students became involved and began to freely exchange ideas in the group setting.

In a review of 15 journal articles on design thinking education in the health professions, McLaughlin, Wolcott, Hubbard, Umstead, and Rider (2019) analyzed common design thinking processes featured in the classroom and the outcomes of those courses. Three programs featured a specific description of the design thinking process which mirrored the d.School Design School at Stanford University model used in this study (i.e., empathize, define, ideate, prototype, test, assess). Six studies incorporated design thinking into the design of curriculum, two explicitly taught students how to

implement the design thinking process, six studies focused primarily on the empathy and problem definition stages, and two studies focused on the latter stages of testing and assessing solutions. All studies described collaboration as a benefit to design thinking in higher education, especially in multidisciplinary teams that promoted diversity of thought to achieve goals. Participants cited design thinking as helping them redefine problems and identify appropriate solutions using a human-centered approach. Incorporating this process into a learning environment has the potential to advance creativity, develop communication skills, and improve patient outcomes. Several studies highlighted the flexibility of the design thinking process and its application in different industries and circumstances.

According to Tu, Liu, and Wu (2018), the incorporation of design thinking as a teaching method improved student learning productivity, increased empathy toward problems, encouraged creative solutions, used teacher assistance to increase student insight, and had students collaborate with peers to brainstorm ideas. Their study explored if design thinking could improve teaching methodology and learning effectiveness using action research, in-depth interviews, and Likert scale surveys in Taiwanese classrooms. Teaching material used in the classrooms of study were from the d.School Design School at Stanford University, the design thinking workshop at the Different Thinking Club at National Taiwan University, and scholarly research on design thinking. The 14 students who participated in this study were from multiple disciplines such as creative design, Chinese language, and literature, visual communication design, cultural heritage conservation, electrical engineering, product design, business administration, industrial design, digital media design, and early childhood education. After course completion,

student participants believed design thinking can help users explore, participate in ideation activities, engage in creative problem solving, and develop prototypes to solve problems. Classrooms that incorporated design thinking into teaching methodology reported increased student participation, an atmosphere that attracts students to the course, improved willingness to learn, and increased interaction between students and teachers. Students in these classrooms credited design thinking with helping them to discover problems, improve their ability to solve the problems, and enhance their communication skills with students from varying disciplines. They also anticipated using the design thinking process in the future to complete design projects. This study demonstrates that the incorporation of design thinking in the higher education classroom is favorably received by students, while allowing them to develop important skills such as creative problem solving and collaboration.

Rassuli and Manzer's (2005) research into group work and team activities as an educational methodology is evidence that students who have longer, favorable involvement in team activities feel more positive toward its effectiveness as a problem-solving method. Furthermore, students who possess effective communication skills had more favorable views and learned more from the team problem-solving method. Daniel (2016) supports this assumption with the results of course evaluations related to student participation in a design thinking curriculum. Compared to the control group, students who participated in the design thinking curriculum were more motivated, satisfied with their class performance, experienced less difficulty completing activities, had more favorable views of teacher performance, and felt as though the classroom environment was favorable for learning and promoted active participation from the students. While

collaboration and communication benefits from design thinking curriculum, Orthel (2015) found through both pre-post analysis and participant observation that students who completed a design curriculum demonstrated improved innovation, as well as elaboration, idea flexibility, and ideation skills. Liedtka (2000) supports the utilizations of design thinking in environments like higher education, as it can be most successful when implemented in the virtual world or “learning laboratories” (p. 14). She describes the primary risk of design thinking is the ease in which early hypothesizing and design progress can result in group commitment to a failing outcome. Hanington (2003) discusses a similar philosophy with “speculative scenarios” serving as a way in which to hypothesize and test possible design issues before the prototyping phase. Higher education classrooms would provide low risk areas where students can problem solve using design thinking with little fear of financial and time investments negatively influencing the process.

Barriers to Design Thinking Education

A recurring theme among Lloyd (2012), Nielsen and Stovang (2015), and English (2018) is the conclusion that disciplines such as business and STEM fields, as well as the educational system itself, require considerable change to accommodate design thinking students. Design thinking necessitates incorporation into the organizational environment before effective implementation in the classroom can be achieved.

Implementation of design thinking requires classroom creativity and changing an educational system which has previously been resistant to large scale modifications at both the micro and macro levels (i.e., faculty and administration). Even courses specializing in studio-based instruction must reassess how design thinking is applied in

the classroom. According to De la Harpe, Peterson, Frankham, Zehner, Neale, Musgrave, and McDermott (2009), a meta-analysis of disciplines such as architecture, interior design, art, and industrial design found interior design and architecture programs emphasizing the completion of a final project or product. Rather than focusing on the process, which is a key component of design thinking, these disciplines focus on the outcome.

Daniel (2016) specifically identifies formal class instruction with its traditional structure where content is taught and assessed without the use of applied learning activities as a barrier to collaboration, creativity, and autonomy indicative of design thinking classrooms. Course evaluation surveys comparing students who participated in the design thinking course versus those who participated in the traditional course without the design thinking integration reported higher satisfaction with teacher performance. Specifically, “capacity to interest and motivate students,” “creation of a favorable climate for learning and participation,” “stimulation of autonomy,” and “accompanying students work” all received higher mean satisfaction scores for the design thinking class compared to the control. He also highlights the disparity between accreditation and design thinking curriculum as a barrier to implementation. Administrators attempting to merge a new school of thought into higher education must accommodate national accrediting bodies and the requirements placed on each discipline and find creative ways to incorporate design thinking into those classrooms without defying educational policy.

Daniel (2016) notes that faculty need to adapt to a changing educational environment where they are no longer responsible for filtering and disseminating the knowledge from each discipline. Design thinking in the curriculum requires faculty to

acknowledge the ability of students to self-teach and problem solve, while they maintain a role of a facilitator who guides students through the learning process. Lastly, design thinking will only be successful in higher education if students of varying backgrounds and program tracks can intermingle in the classroom. Traditionally, students are housed in closed educational tracks within their chosen discipline with minimal exposure to unrelated topics except through core classes required from accrediting bodies. Faculty must also be prepared to acknowledge and incorporate the diverse experience and educational background of students in courses utilizing design thinking (Daniel, 2016).

Communication between Institutions

As noted in previous research (Barrie, 2006; Botha & Coetzee, 2017; Collet, Hine, & Plessis, 2014; Griffin, Cangelosi, & Hargis, 2014; Pool & Sewell, 2007; Robles, 2012; Vyas & Chauhan, 2015), the diversity of both hard and soft skills are beneficial to graduates entering the workforce. Andrews and Higson (2008) found that employers across four countries expected recent graduates to possess discipline-specific knowledge, along with the ability to problem solve, communicate effectively, and be in possession of interpersonal skills. In their study, the expectation of employers was still the same as that shared in similar studies: recent graduates should be “employment-ready,” possess a mix of these skills, and require minimal supervision.

Based on the skills needed for successful employment, the relationship between higher education goals and industry requirements is powerful. Despite this relationship, it is unrealistic to expect higher education to adapt to the varying hard skills required from multiple industries. Such specialization would result in colleges and universities chasing trends based on labor projections. Equally unrealistic is the expectation that higher

education be responsible for a seemingly infinite list of soft skills based on industry feedback. Many of the soft skills identified, especially those involving socialization and communication, are developed outside of the classroom throughout primary, secondary, and post-secondary educational environments. It could be argued that traits such as reliability and work ethic fall outside the purview of educational environments altogether but are nurtured through family socialization.

Although a gap has been identified between higher education and employer expectations of graduates, students are not to be reliant on higher education to assist with determining the types of attributes employers seek. Griffin et al. (2014) in their survey of students from the University of Central Arkansas found that participants identified work ethic and integrity as being the two most important characteristics to employers. These results were confirmed, using previous employer surveys over expectations of recent hires, as characteristics important to potential employers. A potential justification for this alignment of student and employer perceptions, considering the skills gap disparity identified by employers, is that student awareness of skills that lead to marketability in the workforce were generated by external forces, i.e., society. However, knowledge of the desired skills does not result in proficiency in the skills themselves, which could further demonstrate higher education's structure or curriculum as contributing to the skill gap. Collet, Hine, and du Plessis (2015) found significant deficiencies between graduate skills and employer requirements when considering a list of 61 skill items being measured. Results of their study included 207 responses from middle to upper management at employers representing health and community services, property and business services, agriculture, forestry, fishing, mining, manufacturing, and government. Skills reported as

important to employers fell into three content areas: cognitive competencies, intrapersonal competencies, and interpersonal competencies. Employer respondents believed recent graduates within their organization lacked these important skills to a significant degree. Collet et al. (2015) does reinforce through exploratory factor analysis conclusions that have been maintained regarding graduate skill gaps, but also bolsters the argument for paring down and universalizing the language between that which higher education can provide and the needs of industry.

METHODOLOGY

Introduction

The alignment of higher education outcomes with workforce development initiatives continues to drive state and national policy, evidenced by the previously referenced sample of educational governance reports from the Commission on Higher Education in Indiana, Kentucky's Council on Post-Secondary Education, and the Ohio Department of Education. Prokou (2008) and O'Leary (2013) demonstrate a philosophical alignment between the two entities with industry utilizing higher education as a potential hiring pool and students utilizing higher education as a means for attaining employment. Compounding this relationship is the increasing cost of higher education and the subsequent reliance on student loans, creating an environment where degree attainment must not only result in skill development but must also guarantee employability. The problem addressed in the current study is the lack of commonality between the goals of higher education and the expectations of industry. Not only are outputs and expectations disputed between the two entities, but also the range of skills and attributes present in the post-graduate workforce. A combination of soft skills and hard skills is an agreed upon prerequisite for employment, but finding an agreed upon definition, list, or weight of importance is yet to occur (Barrie, 2006; Botha & Coetzee, 2017; Collet, Hine, & Plessis, 2014; Griffin, Cangelosi, & Hargis, 2014; Pool & Sewell, 2007; Robles, 2012; Vyas & Chauhan, 2015). The introduction of design thinking into this equation may produce that agreement. The current study seeks to assess student, faculty and employer expectations as it relates to skills and attributes developed in the classroom for the purpose of gaining employment. These expectations could fall into the

larger aspects of the design thinking process allowing it to serve as a bridge between higher education goals and industry expectations of a post-graduate workforce.

Previous research on design thinking reflected in the literature review often utilized qualitative research to gain an understanding of the design thinking process and its applicability in various settings. Bailey (2018) describes the goal of qualitative research as attempting to understand the experiences of a group through examining their “activities, processes, events, feelings, norms, beliefs, and interactions” (p. 2). She goes on to explain that qualitative research provides a holistic view of the study participants and the issues they face with a depth that cannot be achieved through the conduction of an experiment or the completion of a survey. Attempting to understand the issue of workforce preparedness in recent graduates through the lens of students, faculty, and employers makes qualitative research the obvious fit. Participants in the current study enter the study from diverse backgrounds, professions, life stages, and roles related to the topic of study. A qualitative research methodology allowed for depth of exploration into their beliefs on the topic, while accounting for their varying perspectives.

The research questions guiding this study are as follows:

RQ1: What skills/attributes do employers expect from recent college graduates?

RQ2: What skills/attributes do faculty instill in their students?

RQ3: What skills/attributes do students feel they possess that makes them marketable in the workforce?

RQ4: Are design thinking themes evident in the responses from the three groups?

Research Paradigm and Framework

The following analysis utilized a basic qualitative design to establish an in-depth understanding of undergraduate student attributes and expectations from their perspective, as well as from faculty and industry representatives. The purpose of this study is to explore the alignment of student preparedness (i.e., skill possession) for employment post-graduation. Additionally, employers and faculty were studied to determine the importance of those skills concerning their hiring practices and learning goals, respectively. An interpretive paradigm was used to guide this research study as I am developing a better understanding through multiple perspectives of student preparedness for the workforce following graduation.

Qualities that enhance student preparedness for the workforce is a complex, multilayered concept requiring the exploration of multiple perspectives on the student. The research questions provide the opportunity for students to include their own feelings of professional self-efficacy, their performance in higher education classrooms, and their career readiness upon leaving the confines of academia. The interpretive paradigm allows the researcher to depict the varying effects of the social world on those who exist within that social world (Bailey, 2018). The rationale is that each individual develops their opinions and perspectives which have been shaped by differing experiences. Those differences stem from the reality of their social world. The interpretive paradigm highlights how each of us views the greater world from our personal experiences in our social world. In this qualitative research methodology, both students and faculty bring their own interpretations of “student readiness” or student/workforce alignment into the university setting.

The student perspective focuses on student/workforce alignment shaped by secondary educational experience, the higher education classroom, interactions with peers, and their beliefs about post-grad professional expectations. Faculty interpret student/workforce alignment from historical experience with the student population, interaction with colleagues, the educational environment in which they work, and their role as an intermediary between the theoretical nature of the classroom and the practicality of the workforce. Employers as a study participant group may not directly encounter the university setting, but do shape their perspective of student readiness from professional associations, secondary interactions with higher education through internships or partnerships, and historical experience with the hiring and integration of recently graduated students into the organizational environment. When exploring multiple perspectives regarding the same topic, the interpretive paradigm promotes the acceptance of different social realities around a similar topic (e.g., student/workforce alignment) and allows the researcher to “develop an emergent methodology that is both flexible and interactive” (Bailey, 2018, p. 67).

Creswell and Poth (2018) offer insight into the application of the interpretivist framework in qualitative research. “In terms of practice, the questions become broad and general so that participants can construct the meaning of a situation, a meaning typically forged in discussions or interactions with other persons” (p. 24). Interactions with the student, faculty, and employer participant groups take the form of semi-structured interviews where the participants are allowed the opportunity to explore their impressions and experiences related to student/workforce alignment. These semi-structured interviews conducted as focus groups allow for more discussion around the topic of perceived skills

possessed by recent graduates from the perspective of students, faculty, and employers. The researcher serves as a moderator, offering open-ended questions to promote discussion among research participants.

Merriam and Tisdell (2016) support the use of interpretivism in basic qualitative design, as it provides the foundation for exploring and understanding participant experiences with a given phenomenon. The development of patterns and themes during qualitative analysis using interpretivism allows the researcher to characterize data, provide context, and focus on the process of theory development (Creswell & Poth, 2018; Denzin & Lincoln, 2011; Mertens, 2015). The information obtained in the current study will be triangulated to provide diversity of perspective in understanding the issue around higher education outputs and the needs of employers. Denzin (2012) and Merriam and Tisdell (2016) support the use of triangulation as a qualitative research method designed to achieve an in-depth understanding of a phenomenon, while also increasing the level of reliability of the information obtained. Denzin (2012) goes on to emphasize the inclusion of multiple perspectives around a given phenomenon as “a strategy that adds rigor, breadth, complexity, richness, and depth to any inquiry” (p. 82).

With interpretivism underpinning the current study, the process of research design and analysis falls into a grounded theory approach. The overall goal of this study is not only to describe this concept of student/workforce alignment, but to also develop a theory based on the experiences and interactions of the study participants. This approach is supported by Strauss and Corbin (2007) as it seeks to create a new theory based on the responses from participants, instead of applying previously-held theories. Combining interpretivism and grounded theory, the researcher uses data gathered from study

participants to advance a new theory, which explains the development of skills and attributes beneficial to students in higher education that leads to future success in the workplace (i.e., student/workforce alignment). The current study utilizes the Strauss and Corbin (2007) systematic approach to research and data analysis where the researcher develops a theory based on information, categories, coding, and systematic procedures found while making comparisons between data and thematic elements.

Sample and Data Collection

A non-probability purposive sampling method was used for this study where undergraduate students were selected for focus groups based on the course in which they were currently enrolled. Plummer-D'Amato (2017a) recommends the use of purposive sampling instead of random sampling, as the information obtained will not be generalized to the larger population, but will be used to gain an in-depth understanding of the topic area. Since the current study seeks to understand a topic that occurs on college campuses among college students, Plummer-D'Amato (2017a) supports the use of groups such as students as knowledge of the classroom experience were necessary to participate in the study. Those courses were selected with the goal of incorporating both design and non-design centered classes to increase the diversity of response. The courses will also allow for study participants from differing classes (e.g. freshmen, sophomore, junior, senior) and age range (incorporating both day and evening classes). Similar application of this method will be applied throughout the other groups of study. Faculty will be selected for semi-structured interviews based on courses they teach with efforts made to secure both design and non-design faculty for participation. Departments within the corporation will be selected for semi-structured interview based on their affiliation with both domestic or

international operations and their involvement in design and non-design activities within the company. Rubin and Babbie (2016) support the use of purposive sampling when researcher judgement and study purpose are primary considerations, as opposed to the generalizability of the results.

The student and faculty component of the study will be conducted at a Midwestern, fully-accredited, private, liberal arts and sciences-based university affiliated with the United Methodist Church. The university is accredited by the Higher Learning Commission with a total enrollment (including full and part-time, undergraduate, adult, graduate, and study abroad) of 2,443 students. Full-time traditional undergraduate and Doctor of Physical Therapy enrollment is 1,976 students. The male-female ratio is approximately 46% male to 54% female. Students attending the university represent 55 countries and 44 states, and 86% of the full-time faculty hold their doctorate or terminal degree. The university also has a study abroad campus located in England. Study participants included currently enrolled undergraduate students. Faculty participants included full-time faculty from varying disciplines across campus. Employer participants included management-level representatives from industries with both domestic and international operations and no direct affiliation with the university, aside from some operating within the same geographic location as the university.

A purposive sample of approximately 30 students participated in focus groups during their allotted class time with three to four classes on campus participating. Each class included a different sample of students with no overlap in participants. Classes selected for participation include both day and evening classes to increase the diversity of student participants. Courses were selected from multiple disciplines, encompassing both

hard and soft sciences. Both non-design and traditionally design-based courses were selected to increase the diversity of perspective from the student participants. The researcher also served as the moderator of these focus groups as it is necessary the moderator have a sufficient understanding of the topic and a grasp on the goals and questions necessary for the success of the study (Plummer-D'Amato, 2017b). Students were asked general questions related to the attributes they possess that make them marketable to employers and the influence of faculty and the higher education experience on developing those attributes (Appendix A).

Focus groups were chosen due to their ability to collect data such as ideas, attitudes, understandings, and perceptions from the target population. An ancillary benefit of this method of data collection was the opportunity for individuals with diverse perspectives about a similar topic area to express their viewpoints and foster discussion among one another. This allowed focus group participants to “elicit a range of experiences, views, ideas and attitudes held by a selected sample from the target population on a defined topic” (Plummer-D'Amato, 2017a, p. 346).

Semi-structured interviews were completed with seven faculty members across campus who both develop and teach courses in undergraduate programs. These faculty were from varying design and non-design fields, including both soft and hard sciences. Semi-structured interviews included topics such as how their courses prepare students for employability post-graduation, skills/attributes students obtain through their courses, and how student proficiency in those skills/attributes is measured (Appendix B).

A semi-structured interview method was chosen to allow for creative responses and issues to develop using open-ended questions. Specifically, Ryan, Coughlan and

Cronin's (2009) discovery interview method was used where open-ended questions allowed the study participant to lead the conversation. A series of questions were developed related to the experience of the participant with student/workforce alignment, which helped "facilitate the collection of richer, more textured data" (p. 310). The use of face-to-face interviews allowed for increased understanding of the content of the interview through the interpretation of non-verbal cues such as body language, facial expression, and eye contact (Ryan, Coughlan, & Cronin, 2009).

To assess the employment sector, convenience sampling was used to identify managers across multiple divisions, including both design and non-design areas, of the international operations of a *Fortune 500* corporation who participated in semi-structured interviews. The interviews explored attributes each division seeks in new employees, skills training in which new employees must participate, and the preparedness of recent college graduates to integrate into the company (Appendix C). As with faculty and student interviews, to gain the most information through observing body language, facial expressions, and eye contact, interviews were conducted in person or with the assistance of the Zoom meeting teleconference program. The use of digital teleconferencing programs such as Zoom allowed for the incorporation of perspectives from employer participants operating internationally.

Data Analysis

Interview transcripts were created by recording responses of study participants, then uploading the Mp3 file to Nvivo, a web-based transcription service. The transcription word file was then printed and categorized into the appropriate study group. The process of data reduction was completed on the transcripts for the semi-structured

interviews in order to simplify and focus the content on the topic of study (Ryan, Coughlan, & Cronin, 2009). Focus group data were transcribed as they were collected with no correction for grammar to maintain the accuracy of the data (Plummer-D'Amato, 2017). The transcript and interview notes were analyzed using the constant comparative approach highlighted by Merriam and Tisdell (2016) and Creswell and Poth (2018). The results were organized into sub-categories, then merged into larger categories where appropriate. The categories for participant responses satisfied the criteria discussed in Merriam and Tisdell (2016) by being related to the overall purpose of the study, exhaustive, mutually exclusive, sensitizing, and conceptually congruent. This process of open coding will allow for the creation of major categories, encompassing the data that will be collected. The development of thematic descriptors of the interview data were completed by reviewing the hard copy transcripts and isolating each question or discussion thread. Once each question/discussion thread had been isolated, thematic descriptors were then created by the researcher to categorize the responses. As reported in Chapter 4, the focus group information included extracts and quotations to demonstrate group interaction and to allow the reader the opportunity to assess the reliability of the interpretation (Plummer-D'Amato, 2017). At the conclusion of the analysis stage, the final categories were assessed for thematic similarities related to design thinking. The definition of the design thinking process developed by the Hasso Plattner School of Design will be used to assess whether themes developed from the participant responses fall under the larger, five-step design process.

Ethical Considerations

To ensure trustworthiness of data analysis, the study utilized triangulation, researcher reflexivity, and an audit trail, as described by Merriam and Tisdell (2016). The use of both focus groups and semi-structured interviews conducted with three separate populations (students, faculty, and industry representatives) provided multiple sources of data from differing sources, thereby satisfying the criteria for triangulation of results. During the data collection process, the researcher remained aware of bias toward design thinking and its potential benefit across these entities by ensuring focus group and interview questions did not guide participants toward themes related to design thinking. During data analysis, the researcher remained aware of bias by clearly defining the design thinking process and only categorizing responses that satisfied those design thinking themes. Both precautions related to data collection and analysis satisfied the requirement of researcher reflexivity in the study. A detailed description of the sample selection process, transcript of questions and responses, and thematic analysis of results was maintained to create an audit trail to promote study replication and ensure reliability of results.

Focus group participants and responses are anonymous with only the course title and student major being recorded. No other student identifiers are linked to their responses. A transcript of responses from each sample group was created and stored on a local hard drive. Any hard copy transcripts used for data analysis were stored, along with research notes in a locking file cabinet of which only the researcher has access. Researcher notes were compiled from semi-structured interviews with faculty and participants from the international corporation. The only identifying information retained

from faculty interviews were the department in which they teach. Similarly, participants from the international corporation will remain anonymous except for their corresponding division within the corporation. Research notes were stored on a local hard drive for the duration of the study, then purged upon completion to protect confidentiality of all participants.

Conclusion

The goal of the current research was to develop an in-depth understanding of the opinions held by students, faculty, and employers regarding student skills and attributes necessary for successful entrance into the post-graduate workforce. Upon review of these skills and attributes, the researcher determined themes related to design thinking evident across responses from all those sampled. A review of the literature has highlighted the complexity of defining skills and attributes possessed by the post-graduate workforce, as well as attributing the weight of importance of those skills and attributes in any uniform manner. The application of design thinking definitions could alleviate the miscommunication between higher education and industry by establishing common expectations between the two.

RESULTS

Introduction

University faculty and students, as well as domestic and international employers, participated in the study. Semi-structured interviews were conducted with the faculty and employer representatives who chose to participate. The students voluntarily participated in focus groups administered during their scheduled class time. Student participation during scheduled class time was optional, as they were not offered class credit or extra credit for participation. If students elected not to participate, they were able to miss that class without penalty. Faculty were all interviewed in person, while industry professionals participated via in-person interviews, web chat, or telephone. The primary deviation from the original research design came with the student group, as scheduling random classes for focus group participation was a barrier. Instead, three classes with a diverse mix of undergraduate majors were identified and subsequently participated in the study. Each interview and focus group were recorded and then transcribed using the NVivo transcription software. The transcriptions were then mined for similar themes appearing in each question response, then compared across the three groups. Themes were identified and recorded manually on paper, but quotations were pulled directly from NVivo transcripts.

Two methods of thematic analysis were applied to the results of this study. The first is the establishment of conceptual themes (Bailey, 2018), also described as “semantic themes” in Braun and Clark (2006), where themes are closely aligned with responses from participants and supported by quotations and notes. For the current study, the first round of thematic development was identified as “conceptual themes.” The

conceptual themes will be used to create overarching themes that capture the “underlying ideas, assumptions, and ideologies” behind participant responses (Bailey, 2018, pp. 191-192).

Faculty

Faculty participation included seven members from differing departments, all employed in a full-time capacity by the university. These departments included sociology, engineering, business, chemistry, physical therapy, education, and political science. Except for the engineering faculty, all teach traditionally non-design coursework. To distinguish between the concept of design and non-design course instructors, the standard used by Orthel (2015) was applied due to similarities in research goals between studies (i.e., finding the synthesis between design concepts in design-centered instruction). Orthel’s (2015) description of design-related coursework focused on how something is created, the structure of the components, and how to create something within limitations. Based on these criteria, engineering was designated as “design coursework” and sociology, business, chemistry, physical therapy, education, and political science were labelled “non-design coursework”.

Q1 - Is there a difference between attributes and skills? What is that difference?

Seven (100%) faculty participants believed there to be a difference between skills and attributes, with skills conceptualized as something that must be learned and attributes conceptualized as an inherent trait. When discussing skills, respondents described them as aspects of the individual that “can be developed,” are “learned,” and are “actionable.” When discussing attributes, respondents described them as traits that are “inherent” to the individual or a “characteristic” someone possesses (e.g., gender, height, spirit, mindset).

One respondent stated, “Although I believe you could probably work on attributes, they’re probably much more something you start out with ingrained in you and skills are probably something that you can develop.”

The dual goals of this first question were to determine whether faculty, students, and employers shared similar definitions of skills/attributes and to ensure clear communication between the researcher and the faculty respondent on the questions that followed. After it was established that all participants in the faculty group shared similar interpretations of the skill/attribute difference, the questions that followed focused on skills that can be developed through education.

Q2 - What skills do students have before they enter your class?

One distinct conceptual theme was developed with responses to this question that for the remainder of this paper will be referred to as “discipline-specific skills,” since all three participant groups referenced skills related to their discipline/profession. In this conceptual theme, respondents included skills in disciplines such as mathematics, statistics, business law, economics, and accounting classes. The use of this conceptual theme label to describe professional skills is derived from Muller and Young’s (2014) discussion of “discipline knowledge” and the role of higher education in imparting this type of knowledge on the student body. They went on to define discipline knowledge as “abstract and generally emphasizes conceptual understanding that is defined and legitimized from within the disciplines and forms the ground for disciplinary identity” (p. 32). While the question did require participants to describe skills students possess, respondents focused more on that which was lacking in students under their tutelage. For instance, students were “afraid of failure,” possessed “underdeveloped study habits and

critical thinking skills,” and lacked “time-management skills.” Participants also stated that “High school failed to prepare students for the rigors of college, teaching them only how to take tests.” One participant stated, “It was rare to find intellectual curiosity” among students and another said that “Students seem to be less prepared both in terms of attributes, study skills, preparation, just all-around than what they were 10 years ago.”

Another concept emerged in faculty responses to this question related to “positive student perceptions of higher education.” Faculty described students entering their classes as individuals who “embrace education and the classroom environment” by virtue of their success in high school that eventually led to their acceptance into college. Respondents described students as possessing a desire to improve their lives with the understanding that there was a positive correlation between a college education and future life improvement, but there were no metrics provided to define “improvement” (e.g., career choices, social mobility, self-actualization).

Q3 - What skills do you teach in your coursework?

Responses for this question required a second round of coding to arrive at three concepts to encompass the numerous and diverse responses from the faculty. The critical thinking conceptual theme was developed to include responses covering abstract thought, curiosity and knowledge related to student learning, understanding of their environment, use of analytical skills, perspective shifts, and decision-making for the purposes of problem solving. The conceptual theme of resiliency was developed to include responses related to the ability to learn from, instead of fearing, failure and criticism during the completion of tasks/projects. Lastly, the concept of “workplace skills” was created to encompass skills that faculty focused on in their courses that directly translate to the

employment setting. The skills and attributes incorporated into this conceptual theme contains similar skills and attributes featured in past research on soft skills and employability attributes (Blaszczynski & Green, 2012; Botha & Coetzee, 2017 Cleary et al, 2006; Perrault, 2006). One faculty described the relationship between their coursework and the skills they sought to develop as follows:

So, they have to work with other individuals, perhaps with different personalities and backgrounds and schedules throughout the semester. That adds more pressure, and with the several deadlines they have, that may create even more pressure. But I think that's another good experience for them to learn to be punctual and plan for things and manage their time. They have to do a final report and, of course, they have to write reports. So, these are general skills that I think they will gain that are 21st century skills or soft skills.

Q4 - What exercises are used to teach students these attributes/skills in the classroom?

To teach or reinforce certain attributes/skills, faculty respondents highlighted creative activities not normally associated with traditional classroom learning (e.g., lecture, assigned reading, standardized testing). Sample strategies involved the creation of a board game related to a discipline-specific scenario with multiple outcomes for the player, low-risk/high-stress group projects, year-long class projects designed to develop teamwork and leadership skills, and lectures delivered with false information which promotes active listening, critical thought, and challenges from the students. During interviews, respondents displayed an awareness of the relationship between the skills/attributes they intended to teach in their classroom and their method for doing so. When describing the use of lab projects and journal critiques, one faculty stated, “So, it

actually proves to be more difficult than I think they anticipate. But it gives them those skills of thinking, thinking on their own, critically thinking, and analyzing journal articles.”

When describing the use of an end of the year project, another stated this:

Good leaders should be able to figure out what this person [a new group member and underclassman] has as their talent and should be placed in *this* kind of position . . . and I think that too is a good example of learning to learn because then they actually have to turn around and teach the next generation of students all the things that they’ve learned.

Q5 - How do you measure proficiency in these attribute/skills?

While the efforts made to teach certain skills/attributes are comparatively creative to traditional course delivery, the means of assessment were more standardized with exams and papers as their primary methods of evaluation. One faculty stated,

I’m trying to wean myself off grades. I know that’s really weird coming from someone who teaches. But I think that there are probably better ways to assess student learning. The thing that’s really shocking is that they’ll start working for an employer and the employer doesn’t really care about your grades. They do want to know what you can do with what you’ve learned, though.

Another faculty member discussed the aspiration to utilize more creative grading mechanisms, but for their discipline, the only measure available is standardized testing:

Faculty believe that they are always there to teach raw knowledge. They are not there to teach. We’ve got textbooks for that. Faculty are there to apply the material, to mentor, to make the material meaningful. And so, I think measuring it

has to then focus on growth. It has to be focused on application, has to be focused on those life skills.

Supplemental projects outside of these two categories included larger, semester projects such as presentations made to the business community where student success was measured by the project's potential value to that community and the creation of a new society based on equity where students must defend their rationale for decision making.

Q6 - What attributes/skills do think employers are looking for in new hires?

This question required re-coding like Question 3, but the three conceptual themes remained the same as no new responses could be categorized outside of critical thinking skills, resiliency, or workplace skills. Faculty did discuss discipline-specific skills as something employers looked for in new hires but believed this was something inherent with the hiring process or did not need further elaboration because “When students graduate from college, of course they have the skills necessary to enter that workforce.” Furthermore, respondents delineated between soft skills and discipline-specific skills as separate domains but did not elaborate on the definition of soft skills or provide examples as to what skills could be considered “soft.” In referencing communication with industry professionals, one faculty member stated,

They have complained, not necessarily about our students, but students in general or graduates in general, that they need an excessive amount of handholding to get from Point A to Point B when they first started the job. I think the sense I get is that some folks are freezing out there. They don't know what to do because they've had

educational experiences where they've been told how to get from Point A to Point B and how to look back in the book because that's where the answer is.

Another stated,

I think there's a disconnect right now and we're also seeing it in education as well. I think it's the argument why liberal arts schools are struggling because there's a disconnect on what the world wants and what we say that they want.

And I think once we start listening to what employers want and what our stakeholders and students are telling us, then can we only make effective changes.

Employers

Industry participation included six members from differing professions, all employed in different capacities in for-profit companies and the education sector. Two of the six participants were employed by a technology company with a design department and international operations. The remainder were domestic companies and included education, banking, and finance.

Q1- Is there a difference between attributes and skills? What is that difference?

As with the faculty and student groups, all employer participants stated there was a difference between skills and attributes and defined both similarly. Employer respondents described skills as "learned" or "acquired through training" and an ability was something "inherent" or "natural" to the person. Unlike the faculty and student groups, the employer respondents used the terms interchangeably throughout the interview process. One employer described skills and attributes as follows:

But the way I look at it, an attribute is a nature of your personality. You know, you are punctual. You are cheerful. You are disciplined. You are hardworking.

You are good at managing your own timetable. Whereas a skill is fairly specific to an activity. Like I'm especially good at being analytical or I have a Microsoft Word certification or I'm Certified Public Accountant.

The previous quote highlights a common occurrence among the employer group; as for this question specifically, respondents would define a skill and attribute as being two completely different concepts: an attribute is inherent to the person, but a skill is something that must be learned. This highlights that attempting to provide examples for these two concepts results in the concepts being used interchangeably, as it can be argued that "being analytical" could be perceived as an attribute or "hardworking" (more consistently defined as possessing strong work ethic) could be considered a skill that can be developed.

Q2 - What attributes/skills do you look for in new hires?

The responses to this question were recoded into the conceptual themes of critical thinking skills, resiliency, workplace skills, and discipline-specific skills with all responses falling under those larger concepts. The two conceptual themes receiving the most discussion were discipline-specific skills and workplace skills. Discipline-specific skills were sometimes identified as "basic arithmetic" for the banking industry or "classroom education skills" for the education sector, but all described skill sets specific to their career. The workplace skills concept included descriptions of "soft skills," "teamwork," and "communication." One respondent stated,

It's more about personal relationships. Of course skills, the basic knowledge of teaching, but then through the interview process you try to pick up on how we feel they would work with different personnel, different people, how they would

handle some situations. Again, some of those are learned skills, like time management, things of that nature, but then some of those you either have or you don't.

The critical thinking conceptual theme included descriptions of “problem-solving” skills and “curiosity,” while the resiliency concept focused on wanting employees who were “receptive to criticism” and demonstrated “flexibility” in how well they “handled different people in different situations.”

Q3 - Do universities prepare students with these attributes/skills?

Responses to this question were recoded as “positive” or “negative” perceptions of the success of higher education to prepare students with the skills mentioned in the previous question. Although the question was closed-ended, all respondents provided context around their answer allowing for a positive or negative interpretation. Five respondents described negative perceptions of the efficacy of higher education to prepare students with necessary workforce skills. Two of those respondents found higher education lacking in all workforce preparation, describing a situation where new hires find themselves learning the most important aspects from “on-the-job training.” The remaining three respondents describe higher education as capable of developing the discipline-specific conceptual theme, but then described the inability of higher education to develop skills in their student body that would fall under the conceptual themes of critical thinking, resiliency, and workplace skills. One employer participant stated,

There is not enough focus put on the communication part of a person's education. I think writing clearly and simply, especially speaking clearly and simply, learning how to prepare a presentation in a way that that gets to the point, sort of

provides necessary information up front. There's just to me not quite enough explanation of how to communicate or teaching of how to communicate.

Another stated the following:

I think it's harder when you think about soft skills, and I think that's harder to be trained in at universities. Often when people come from university, they have a lot of theoretical knowledge about topics. The link to real work life is somehow missing.

One respondent who described himself as "unsure" due to his position in the company and the fact his department rarely hires candidates directly from the higher education environment, as they require individuals to possess some life experience in a separate company or move upward within his own company.

Q4 - How do you assess whether potential hires possess these attributes/skills?

While respondents all used an interview process to determine whether new hires possess desirable skills, many utilized an assessment outside of the traditional one-on-one interview (only one assessed organizational fit and communication using this traditional style). Based on the descriptions from respondents, the theme of "experiential interview" was coined to describe this method. Respondents utilized an experiential interview in two distinct ways. The first was to explore the background of the new hire through traditional means (e.g., conversation, references, academic records, résumé, etc.) for the purpose of identifying history experiences and participation in activities that coincide with the employment sector. Examples of this included "a history of participation in extra-curriculars" and "internships." The second way was through the demonstration of those desired skills during the interview process by simulating the workplace environment or

creating a workplace problem, then assessing the candidate's ability to navigate those situations. One respondent described their exploration of the background experience of new hires as follows:

For a brand-new college graduate, I'll look for things like internships. Have they had contact with the real world, and have they brought their academic knowledge face-to-face with the real world more than once? What activities on campus have they been involved in and had they shown leadership? Have they been involved in activities where communication is important? Were they involved in lots of things outside of their academic studies, but they still got good grades? That tells me a lot about organization, discipline, and time management.

Another employer respondent described the assessment of a new hire using a workplace simulation where the potential hire was placed in different social environments (e.g., a social event with clients, interdepartmental meetings) and their interactions were evaluated.

They'll come with me to a non-profit event, and I'll be looking at how they introduce themselves to people. How do they engage in conversation? How do they interact with waitstaff? Really . . . if you can't handle yourself in a respectful way, you can't engage in a polite conversation with an executive director or a major donor, well I'm never going to be able to deal with that.

Another participant described an interview process where new hires were grouped into teams and given 90 minutes to solve a problem for a client, then present their solution.

So that's how we're judging candidates, when they're working together to find agreement, alignment, consensus to build something together and work quickly and agilely in a matter of I guess 90 minutes to pull together a short presentation. Then the other test is a design test where they are presented with a problem where an insurance company needs a better way of doing X, Y, Z, and we tell them to take 20 minutes to prepare. Then they present a project timeline as well as what a solution might look like.

Q5 - What attributes/skills should students be developing in the classroom that would make them successful in your company?

The responses to this question were recoded into the conceptual themes of critical thinking skills, resiliency, workplace skills, and discipline-specific skills with all responses falling under those larger concepts. The most popular skills discussed by the employer respondents fell under the conceptual themes of critical thinking skills and workplace skills. The critical thinking concept included a skills discussion around “problem-solving” and “critical thinking,” while the most common skill appearing under the workplace concept was the development of “soft skills.” For instance, one said,

Where you're working together collaboratively, much more agile, working through potential prototypes and solutions and testing them and experimenting with ideas in a low-fidelity, quick-sketch kind of fashion. That's something I think could be pushed and I know it's very trendy now. But that sort of business innovation topic is still a useful one and the more people have experience experimenting, testing, working through close to real-world situations, the better.

The resiliency conceptual theme included again a discussion of “flexibility,” while there was minimal discussion about discipline-specific skills. A possible reason for this could be related to the belief or assumption that higher education is currently successful in teaching discipline-specific skills. “Diverse course work” was mentioned here, as it was in the student responses, with the employer respondent clarifying that higher education should be developing well-rounded potential employees.

Students

Three focus groups were conducted among undergraduate students from differing majors across campus during their regularly scheduled class time. Thirty-seven students participated in the focus group sessions. Focus groups #1 and #2 met during the day and focus group #3 met during the evening with the intention of gathering responses from both traditional and non-traditional college students. Focus group #1 had 11 participants, focus group #2 had 14 participants, and focus group #3 had 8 participants.

Q1 - Is there a difference between attributes and skills? What is that difference?

As with the faculty and employer groups, skills and attributes were described as two separate categories with differing conceptual themes developing from them. When discussing skills, respondents described something that “can be developed” or “learned,” while attributes were described as “inherent” to the person or “qualities” that someone possesses.

Q2 - What attributes/skills do you think you possess?

Responses for this question required a second round of coding to arrive at three concepts to encompass the numerous and diverse responses of the student group. The same conceptual themes emerged in the student group as the faculty and employer group:

critical thinking skills, resiliency, and workplace skills. Student respondents who described possessing basic math and science skills were categorized into the conceptual theme of “discipline-specific skills”. While all student responses fit into those conceptual themes, the perceptions of the skills they possess differ greatly from the faculty responses about the skills possessed by those in their classrooms. Critical thinking was the least common theme with “problem solving” as the only response that could be organized under that concept. Student responses of “flexibility” and “determination” were organized under the resiliency conceptual theme. Overwhelmingly, students indicated that they currently possessed skills that fell under the conceptual theme of workplace skills. Common responses from students in this concept was “time management,” “detail-oriented,” and “teamwork.” One respondent stated, “I think that like being in college has helped my time management skills a lot. Sometimes you have to focus on dividing your time studying and going to classes and also having a part-time job.”

Discipline-specific skills could only be identified in three responses, but it remains unclear whether this is due to an expectation that because they are enrolled at a university, then they would possess some level of proficiency in the course content.

Q3 - What attributes/skills have you learned in your university course work?

Responses to this question were recoded into the previous conceptual themes of critical thinking skills, resiliency, and workplace skills. The critical thinking theme consisted of responses such as “problem-solving” and “critical thinking.” A respondent described it as follows: “How to make connections between like concrete things that you learned in school and what’s going on with regard to the big picture, in the rest of the world.”

The resiliency theme included responses such as “flexibility” and “open-mindedness.” When asked to elaborate on the skill of open-mindedness, students described being able to process contrary information or being open to new ideas. While “open-mindedness” could fall under the critical thinking theme, the context around the response focused on receiving information that may be new or challenging to existing belief systems, not around operationalizing that information for problem-solving. One student stated, “I learned how to be more open-minded and respectful of people of different races and religions. I also learned to work with a team a lot more.”

Workplace skills included responses such as “public speaking,” “time management,” and “communication” as those that were learned during the course of university study. One rationale for more discussion around the discipline-specific conceptual theme in this question than question #2 is the direct association the students were asked to make between skills they have learned specifically at the university. Respondents described “conducting research” and the benefits of “diverse coursework” as discussed here:

Because of the gen ed requirements, I got tapped into a lot of things I would have never imagined . . . like archaeology, which I didn’t really like. Or like theater and I guess it made me see a lot of areas or subjects that I never actually considered. I have more knowledge about more things than just major or minor.

Q4 - What attributes/skills do you think employers want?

For this question, an additional conceptual theme was added to account for a series of responses that could not be organized into critical thinking skills, resiliency, workplace skills, or discipline-specific skills. The student group, unlike the two previous

groups, described attributes or characteristics employers seek in candidates. Responses for the previous groups were always organized into conceptual themes developed from skills identified by respondents. Each group also made a delineation between skills and attributes with the consensus being that skills can be learned or developed over time, while attributes are inherent to that person and static. Responses that fit more clearly into an “attributes” conceptual theme were “motivation,” “confidence,” and “passion.” Even though the context around these responses focused on “workplace perceptions” and “behavior in the workplace,” none were determined to be skills developed in a university for the workplace. Instead, they were organized into an “attributes” domain since the responses align more with an employees’ personality and their internal response to their external environment (i.e., the workplace environment). The critical thinking conceptual theme received limited discussion for this question, like question #2, with a respondent only citing “creativity” as a skill desirable to employers. Although the resiliency theme did receive more discussion around those underlying skills (e.g., open-mindedness and flexibility), the workplace skills concept was identified as most desirable to employers. “Teamwork,” “work ethic,” and “soft skills” were most discussed among student respondents. When describing resiliency, one respondent stated, “I think also they want employees to know how to handle challenges if something is thrown at you, an obstacle, you have to know how to overcome and not just worry.”

When discussing workplace skills, another student stated the following:

I agree with soft skills. At my previous job, they used to hire computer science majors to work in customer support, but they quickly moved away from that because they found most students didn’t have the people skills to patiently walk

somebody through a problem so it takes people skills and motivation to finish your work.

During the administration of focus groups and during data analysis, Question #4 was merged into Question #5 (Appendix A) as students exhibited confusion at the similarity between questions. Their answers also reflected the similarity between these two questions, as many participants answered in the same manner for Questions #4 and #5.

Analysis of Conceptual and Overarching Themes

Based on the recoding of transcripts, participant responses established two similarities groups. First, the concept of “skills” is something that can be learned, developed, and improved upon. Attributes are static, inherent aspects of the individual. Regardless of whether participants were describing teaching goals, classroom experience, or workplace expectations, it was clear they were describing “skills.” Second, the responses from the three participant groups for questions related to skills fell into the following conceptual themes: critical thinking skills, resiliency, workplace skills, and discipline-specific skills. Responses and conceptual themes were organized by participant groups to gain insight into potential overarching themes evident in this study. These responses and conceptual themes allowed for conclusions to be attributed to the faculty, student, and employer groups. Those conclusions are listed as follows:

Faculty

- Believe they teach critical thinking skills, develop resiliency, and promote workplace skills in their students
- Believe students are not adequately prepared for college

- Uses non-traditional teaching styles, but rely on traditional evaluation methods such as standardized testing
- Believe employers are heavily focused on hiring students that possess workplace skills

Students

- Believe they currently possess workplace skills above all other skills
- Believe they are being taught critical thinking skills, resiliency, and workplace skills in their coursework
- Believe employers are interested in new hires who possess workplace skills

Employers

- Believe students possess discipline-specific skills, but lack critical thinking, resiliency, and workplace skills
- Believe college fails to prepare students for the workforce
- Focus on discipline-specific skills and workplace skills during the hiring process
- Use “experiential interviews” to assess past experience or current situational competency in the employment sector
- Believe students should be developing critical thinking skills and workplace skills (specifically soft skills) while in college

To establish an overarching theme, these conclusions were compared among groups to determine where agreements and disconnects existed. Due to the similarity of questions asked of participants, it was possible to examine these agreements and

disconnects among groups. For instance, faculty believe they teach critical thinking, resiliency, and workplace skills in the classroom and the student group states that they are receiving those skills as part of their education, but the employer group feels that when they hire recent graduates, those individuals lack critical thinking, resiliency, and workplace skills.

Another area identified is that of preparation. Faculty felt students were ill-prepared for college, while employers felt recent graduates were ill-prepared to join the workforce. Even though this topic was not part of the interview script, faculty respondents focused on this topic during the answers to Question #2: “What attributes/skills do students have before they enter your class?” Their responses to this question focused on their responsibility to not only teach discipline-specific material, but to also teach critical thinking and resiliency skills that were not developed during their secondary education experience. The employer group shared this perception of their roles with new hires. Believing recent graduates lacked critical thinking, resiliency, and workplace skills, employers find themselves in a position where new hires possess discipline-specific skills but require on-the-job training for the remaining skills. In the employer responses, there was a consistent belief that those skills, specifically workplace and critical thinking, should have been developed at some point in their higher education experience. The nearest question asked of the students to link these three group responses was Question #2: “What attributes/skills do you think you possess?” Students felt they possessed workplace skills above all other conceptual themes, yet the responses from faculty and employers indicate otherwise.

All three groups were in accordance with the transmission of discipline-specific skills. Discipline-specific skills were mentioned least among the student and faculty groups when answering questions related to “skills being emphasized in the classroom” or “skills important to employers.” In the student focus group setting, respondents preceded a discussion of discipline-specific skills with verbiage such as “obviously” or “definitely” and the focus group members would indicate the affirmative both audibly or through body language (e.g., nodding) indicating that discipline-specific skills are inherently a part of their educational experience or that somehow it should go without saying that employers expect competency in their sector of the workforce. The faculty group echoed a similar sentiment regarding discipline-specific skills, but instead of offering affirmative verbal cues, they would precede any discussion of classroom instruction or course evaluation by discussing requirements of accrediting bodies in a particular subject area or discussing reading material and activities (e.g., lab work) or they would emphasize the importance of subject competency before focusing responses on the critical thinking, resiliency, and workplace skills. While the employer group demonstrated negative views on the success of higher education in effectively building workplace skills in students, participants did have favorable views on the effectiveness of higher education to deliver a competent workforce in varying employment sectors.

After analyzing transcripts, recoding responses, creating the conceptual themes, and comparing conclusions among each participant group, an overarching theme evolved. There is a disconnect between what higher education thinks it produces (recent graduates that enter the workforce with a diverse set of skills) and what employers receive (new hires who are competent but lack workplace skills). Initially, the focus was on a possible

communication gap among the groups where concepts such as 21st century skills or soft skills or interpersonal skills were all being used interchangeably by the parties to describe the same skillset. Based on the exploration of responses to Question #1 (“Is there a difference between skills and attributes?”), the participant groups demonstrate a clear separation between skills and attributes and define these concepts similarly. While conceptual themes were created based on the coding and recoding of responses to skills-related questions, there was also consistency in verbiage used among participant groups. For instance, “teamwork, flexibility, and problem solving” appear in responses from each group for every question that requires respondents to “list skills,” and each of those words recoded into a separate conceptual theme. The primary difference between how responses recoded into conceptual themes was not the verbiage used, but the weight attributed to each theme. For example, when asked which skills students should be developing in the classroom, the majority of employer responses recoded into the critical thinking and workplace skills, conceptual themes resulting in a heavier weight for those themes compared to resiliency and discipline-specific skills.

Based on these conclusions, it does not appear the disconnect is attributable to a miscommunication between higher education and employers, but instead an expectation gap exists. One faculty participant summarized employer expectations as follows:

I think the reason is that they believe there should be a certain or a standard level of basic knowledge that students should have if they have gone through their undergraduate program and they have received a degree in business. So, I think what they are looking for is above and beyond that.

Another faculty participant expanded on why higher education struggles with this “above and beyond” expectation:

Faculty believe that they are always there to teach raw knowledge. They are not there for that. That’s what they (students) have textbooks for, or they can go online. Faculty are there to apply material; faculty are there to mentor; faculty are there to help the material be meaningful. And so, I think measuring it has to then focus on growth. It has to be focused on application, on the development of those life skills.

Another faculty respondent referenced their communication with industry representatives over a similar topic of recent graduate performance in their companies:

..So, they have complained not necessarily about our students, but graduates in general that they need an excessive amount of hand-holding to from Point A to Point B when they first started on the job. And so just taking initiative trying to learn and being given a goal and taking the initiative to ask questions. I think the sense is that some folks are freezing out there. They don’t know what to do because they’ve been told, you know, they’ve had educational experiences where they’ve been kind of told “This is how you get from Point A to Point B, and if you want to know how well you did, look in the back of the book and that’s where the answer is.”

This overarching theme of an expectations gap which separates higher education and employers, thereby isolating students who participate in both institutions, was evident in both faculty and employer responses. Faculty responses to one question highlight this expectations gap. When asked how faculty evaluate student attainment of

critical thinking, resiliency, and workplace skills, all relied on traditional evaluation methods such as papers and exams. Some faculty respondents also incorporated subjective evaluations of class projects, and one faculty member who taught in the sciences utilized lab projects that required students to demonstrate proficiency in certain discipline-specific skills. One faculty respondent described the difficulty of incorporating critical thinking, resiliency, and workplace skills with courses originally designed to impart discipline-specific skills:

I don't push them enough to develop those skills. Part of it is the structure of the course. I don't feel there's enough time, but I think it's a cop out, too, because I think in most courses we've got to get that content to them and that's at the expense of these skills. And now, I'm just trying to learn how not to say "To hell with the content" but give them these skills and let them go out and fill in the content.

This sentiment is shared by faculty respondents for this question where they understood which skills they must incorporate into their classroom, but there was minimal consensus on how best to balance those skills with discipline-specific skills, let alone evaluate a student's competency level which remains rooted in traditional evaluation methods. One respondent stated the following:

I'm trying to figure out how to put the scale on [these skills] is the biggest problem we've had. And I think we're just now getting to the point where we might be using rubrics to be able to provide at least some sort of score to some of these other kinds of skills, but I don't think we're there yet.

Another echoed this concern:

That's a million-dollar academic question right there. So, obviously it's just been cognitive markers. A test. Here's your number. That's arbitrarily decided to be important. There you go. We're actually working on non-cognitive skillsets to look at and obviously a little bit harder to measure. But looking between the lines, I would be the first to tell you faculty misunderstand their roles.

The expectation gap as an overarching theme is evident in the employer responses when asked specifically whether higher education prepares students for the workforce. The employer group all responded negatively to this question, except for one participant who found the question difficult to answer since many employees entering his department have already been in the workforce for some time. One employer respondent stated,

I think career services and experiences like that are trying to say "Okay, how do we mold the clay first?" I don't think universities are that far along because they have been skill driven [discipline-specific skills]. Now there's this really wonderful and rich, not well understood movement about holistic development of the student. What it's going to take? I don't know. Another generation maybe?

There are commonalities between this response and other employer responses with all speaking favorably about the success of higher education in imparting discipline-specific skills in the students. Another mitigating response that is shared among employer participants is how higher education has improved career services and internship offerings, but at the same time, respondents caveated this opinion by stating that certain disciplines require internships during the freshmen year, not senior year and that internships should be more frequent and diverse, requiring students to spend anywhere between six weeks to an entire semester integrated into an organization. One respondent

described the difference between programs at European universities and those in the United States as follows:

There's a much bigger diversity of colleges and universities here and a lot of people do a lot of work experience than doing a typical four- or five-year undergrad degree and sort of entering the job market totally fresh. Unlike the U.S., they've spent some time on the job. They're doing some practicum or an internship.

The negative feedback from employer respondents focused on the inability of higher education to develop critical thinking, resiliency, and workplace skills in the students. While respondents focused on individual skills that recent graduates lacked, many described a larger issue of new hires being unfamiliar with the "real-world" application of material or "real-world" expectations in the organization. Referencing both issues, one participant stated,

I think it's harder when you think about soft skills. I think that's harder to be trained at universities. For example, you talk about whether somebody is willing to receive constructive feedback. I mean obviously you receive a lot of feedback at universities each time you hand something in, but I think it's different. It's different to the feedback that we're looking for when people are working in a team, so there's much more direct feedback. "This was the consequence and maybe next time you should try something else." So really there is this direct feedback that helps somebody grow. I'm not sure that's something that students learn at university. I think this is why AGILE and Design Thinking is getting more and more important in some areas at university. . . . Often, when people

come from university, they have a lot of theoretical knowledge about topics, but the link to the real work life is somehow missing

The student group experiences this expectations gap differently than the faculty and employer groups, as they are the linking pin between one group that develops their skills and another that utilizes them. Student respondents aligned with the faculty respondents about the skills being taught in the classroom (e.g., critical thinking, resiliency, workplace skills, and discipline specific skills). Student respondents also aligned with employer respondents on the discussion of skills most important when hiring new employees, even though student responses weighted heavier in the workplace skills conceptual theme than did the employer group. The student expectation gap becomes most evident when looking at how they responded to the question about skills already in their possession. Student respondents overwhelmingly believed they already possessed critical thinking, resiliency, and workplace skills, but believed they possessed workplace skills above the other conceptual themes. During the recode for this question, only three responses fell into the critical thinking and resiliency conceptual themes, while 20 responses fell into the workplace skills conceptual theme. The expectation gap with the student group is exhibited by their own perception of their ability which is a conclusion not shared by the employer respondents. One possible reason for this perception could relate back to the difficulty experienced by faculty in consistently teaching and measuring competency in those skills. Essentially, if students know they are being taught critical thinking, resiliency, and workplace skills in the classroom, there becomes an expectation that passing the class equates a demonstrable competency in those skillsets.

Based on the participant responses and conceptual themes, along with a comparison of these groups, the overarching theme of an expectations gap existing among faculty, students, and employers was established. Chapter 5 will explore solutions to this expectations gap by presenting the design thinking model as a potential bridge between these groups.

DISCUSSION

The current study developed from the desire to gain an in-depth understanding of stakeholder views of higher education outputs through the experiences of students, faculty, and employers. Each of these groups represents a different stage and each plays different roles in the higher education system with students receiving the skills training, faculty providing the instruction in those skills, and employers receiving a workforce of recent graduates. In reviewing the research questions and responses from participants, faculty, students, and employers agree on the static, inherent nature of attributes, believing that skills are in fact concepts that students develop before entering higher education, continue to learn and refine while there, and should demonstrate proficiency once in the workplace. The issues explored in depth by this study are the diversity of skills desired by the participant groups and whether students are viewed as proficient in those skills. While there was alignment in the skills deemed important by faculty, students, and employers, ambiguity emerged in the degree to which students possessed those skills and the degree to which faculty transmitted those skills in the classroom.

Communications Gap?

The origins of the current research arose from the recognition that employers must draw from a hiring pool of recent college graduates to defray training and education costs, while also obtaining a skilled workforce. Students entering college acknowledge the expectation that upon graduation they will be imbued with marketable skills that will result in their incorporation into this hiring pool (O’Leary, 2013; Prokou, 2008). The problem to be addressed by this research was a lack of commonality (or a miscommunication) between higher education and employers. This potential

miscommunication explored earlier using the concepts of hard skills and soft skills and their varying definitions with the presumption that an agreed upon list or weight of importance did not exist between these two groups. Much of the research treated hard skills as a concept related to technical skills or discipline-specific skills offered in college courses such as accounting, leadership, or entrepreneurship. These skills usually carried a direct correlation to university coursework or learning goals associated with those courses. Soft skills were a more nebulous concept, often used interchangeably with interpersonal skills, social skills, and intrinsic traits. Also included in this concept of soft skills were the previously mentioned leadership and entrepreneurship skills. To compound this issue of lack of consensus around soft skills, skills such as writing and public speaking, which both fall under formal class instruction at the university level, were often not included as a discipline-specific or technical skill. In this mix of skill categorization and definition fell concepts reflected in this research study such as critical thinking, teamwork, time management, and problem solving, further demonstrating a lack of consensus in previous studies as to which skills are soft and which are technical. (Barrie, 2006; Botha & Coetzee, 2017; Collet, Hine, & Plessis, 2014; Griffin, Cangelosi, & Hargis, 2014; Pool & Sewell, 2007; Robles, 2012; Vyas & Chauhan, 2015).

To address this, all three participant groups were asked the same question about their definitions of skills and attributes to establish whether all groups were consistent in their understanding of these concepts. Students, faculty, and employers shared consistent definitions of skills and attributes with the former being dynamic and the latter being static. Another similarity was the belief that skills could be developed over time. The establishment of “skills” and “attributes” as two separate categories, along with those

labels appearing across participant questions was to allow for this possible distinction between concepts. This distinction was intended to accommodate a possible miscommunication between higher education and employers regarding qualities of recent graduates. Regardless of differing descriptors used across the literature, the participants in this study not only differentiated between skills and attributes, but often adopted the term “skills” when discussing recent graduates or classroom instruction. Minimal discussion was had referencing attributes or qualities that were viewed as unchanging in the recent graduates. More so, all three participant groups discussed similar skills they either possess, teach, or find desirable in the recent graduate population. Based on this, the initial presumption is not likely related to different understandings or definitions, but still possibly to the list and weight attributed to employability skills. Although the conceptual themes of critical thinking, resiliency, and workplace skills are developed from participant responses, the individual skills that constitute these themes recurred across the participant groups (Table 1).

Table 1***Participant Group Responses to Skill Questions***

Employer Responses (Q2 & Q5)	Student Responses (Q2, Q3 & Q4)	Faculty Responses (Q3 & Q6)	Conceptual Theme
Interpersonal skills (2) Soft skills Team player (3) Agile training Service oriented Empathetic (3) Communication (2) Work ethic	Patience (2) Soft skills (2) Detail oriented Conflict resolution Time management (7) Perfectionism Emotional intelligence Listening Teamwork (7) Communication (4) Public speaking (2) Fast learner Work ethic (5) Work under pressure Multitasking Networking	Teamwork (5) Soft skills (2) Work under pressure (2) Presentation skills Time management (2) Interpersonal skills Work ethic (2) Patience Communication (5) Empathy Dependability (2)	Workplace Skills
Curiosity (2) Problem solving (6) Critical thinking (2)	Problem solving (4) Open mindedness (6) Critical thinking (2) Creativity	Appreciate ambiguity Deconstructing knowledge Social construction Critical thinking (9) Problem solving (6) Curiosity Different perspectives Decision-making Analytical skills	Critical Thinking Skills
Receptive to criticism Flexibility (3)	Flexibility (8) Ask for help Determination Resiliency (2)	Resiliency (4) Finishing Don't fear failure Open to criticism	Resiliency

Not only do these individual skills appear across study participant groups, but surveys attempting to assess employer needs and recent graduates have found similar

verbiage used amongst those two groups. A study conducted by Payscale (2016) found similar concerns among hiring managers regarding skills gaps in recent college graduates. Of 63,924 managers who were surveyed, 60% believed critical thinking/problem solving was the “most commonly lacked” soft skill. From there, 56% cited “detail-oriented.” 46% “communication,” 44% “ownership,” 44% “leadership,” 36% “interpersonal skills/teamwork,” and 25% “grit.” While this study only categorized skills into the broad areas of soft and hard skills, it is evident that these responses mirror the same found among employers during the semi-structured interviews of the current study. The verbiage used in the Payscale (2016) study was like that used by employers in the current study, demonstrating alignment with conceptual themes created from employer interviews. For instance, the critical thinking conceptual theme contains the problem-solving skill. The workplace skills conceptual theme includes the detail-oriented, communication, leadership, interpersonal skills, and teamwork skill sets. Lastly, the resiliency conceptual theme includes the ownership and grit skill sets.

Hart Research Associates (2015), through a study on college learning and career success commissioned from the Association of American Colleges and Universities (AAC&U), incorporated similar skill sets into survey questions, although theirs were based on AAC&U derived learning outcomes. Even in their parsing out of learning outcomes to create survey questions, the same skill set language arose when comparing recent graduates and employers. Employers in the Hart report identified the following skill sets as “very important” in their responses: communication (85%), teamwork (83%), writing (82%), decision-making (81%), critical thinking (81%), skills applications to real-world situations (80%), problem-solving (70%), locate/organize/evaluate information

(68%), creativity/innovation (65%), staying current on work-related technology (60%), understanding numbers/statistics (56%), and problem-solving with co-workers from differing backgrounds/cultures (50%). The National Association of Colleges and Employers (NACE) (2016) returned similar findings where respondents to the Job Outlook survey listed leadership (80.1%), teamwork (78.9%), written communication (70.2%), problem solving (70.2%), verbal communication (68.9%), work ethic (68.9%), initiative (65.8%), analytical skills (62.7%), flexibility (60.9%), technical skills (59.6%), and interpersonal skills (58.4%) as most important when considering new hires. The Society for Human Resources Management (SHRM) (2016) found work ethic, soft skills, business acumen, written communication, critical thinking/problem solving, leadership, life-long learning/self-direction, teamwork, coaching skills, and flexibility as the top skills lacking in recent college graduates. While the Hart Research Associates (2015), NACE (2016), and SHRM (2016) reports may include skill sets in the form of higher education learning outcomes or feature some variation in verbiage, the conceptual themes and responses from the current research continue to be reflected. Communication, teamwork, writing, decision-making, critical thinking, problem-solving, work ethic, flexibility, and creativity/innovation were all skill sets incorporated into the creation of the conceptual themes in the current work.

The studies highlighted above attempt to understand the skills gap by allowing participants to articulate the skills important to successful employment or by exploring which skills make up higher education learning outcomes. Regardless of method, their survey results align with the current study both in verbiage and importance of certain skills over others. Another area of possible miscommunication lies with student

perceptions and understanding of important workplace skills. The current study demonstrated alignment among student participants, employers, and faculty specifically, on workplace skills. Employers emphasized the importance of workplace skills by attempting to assess their presence in new hires. Faculty acknowledged them as skill sets heavily focused on by employers. Based on student responses, this group overwhelmingly believe employers are interested in seeing workplace skills possessed by new hires. Hart Research Associates (2015) supports this finding as employers and students aligned on the level of importance of what they labeled as “cross-cutting skills” such as communication, teamwork, decision-making, critical thinking, and real-world knowledge application. The employer respondents in the current research describe similar skill sets as both important and most lacking in recent college graduates. While the terminology “cross-cutting skills” is not used by the employer participants, verbiage such as communication, interpersonal skills, critical thinking, problem solving, and flexibility is found across interview responses. The employer group also emphasizes this need for recent graduates to possess real-world knowledge either through recommending that colleges begin implementing coursework or internships with that as the primary focus. Employers echoed this through their reported interview practices as well, often requiring candidates to demonstrate their proficiencies through simulated trials or observed workplace integration.

The presumption of a possible miscommunication is further weakened by these and other studies that demonstrate higher education and employers are speaking the same language when discussing necessary hard and soft skills that should be present in recent college graduates. Employers understand which skills are vital to success in their

workplace and which are lacking in recent college graduates. Institutions and higher education accrediting bodies have also incorporated the same skill sets featured in this and the above-referenced studies into their learning outcomes. Higher education has recognized the necessity of incorporating learning outcomes into the institutional mission for this express purpose. Government funding and accreditation is often tied to outcomes that correlate with competency in a specific discipline, thereby appearing to satisfy the needs of employers. Departments within these institutions, through increased specificity of learning outcomes, increase the alignment between workforce needs and curriculum completion of the students (Caspersen, Frolich, & Muller, 2017; Hadjianastasis, 2017; Proitz, Havnes, Briggs, & Scott, 2017). Based on this, it is unlikely that a communication gap exists between higher education and employers with regard to skill sets important to the employability of recent graduates, but instead there is an issue with how to effectively transmit and measure the presence of these skills in the curriculum.

The Expectations Gap

Based on the findings from this study, as well as support from studies on similar topic areas, the conclusion presented in this paper is that an expectations gap exists between higher education and employers, with students caught somewhere in the middle between these institutions. Clearly stated, employers expect recent college graduates to possess both discipline-specific skills and an assortment of, as explored in the current study, critical thinking, resiliency, and workplace skills that will adequately prepare them to begin employment with minimal additional training. Students expect upon receiving their diploma that they are in possession of those same skills desired by employers. Faculty expect that by creating and administering a curriculum, guided by those above-

mentioned skills, that students have effectively developed those skills to a degree that will satisfy employers.

Employers

Employers rely on higher education to provide a skilled and competent hiring pool. The findings from the current study confirm that employers agree that recent college graduates possess competency related to discipline-specific skills, but are lacking in critical thinking skills, resiliency, and workplace skills. This conclusion is supported by Hart Research Associates (2015) in their findings that 58% of employers believe improvements need to be made in higher education in order for graduates to achieve those necessary skills and knowledge necessary for success in entry-level positions in their company. Almost two thirds of respondents (64%) felt improvements are needed in higher education to ensure graduates possess skills and knowledge that would result in career advancement within their company. Evidence of this expectations gap is not entirely new, as Cappel (2001) highlighted in his study of employer opinions of recent information systems students. The findings were similar in that “non-technical” skills were weighted heaviest in their importance when assessing new hires but also appeared most lacking.

The employer respondents in the current study rarely discussed assessing discipline-specific skills in the interview process. When listing skills most important in new hires, few participants even mentioned discipline-specific skills. Instead, the heaviest emphasis in both desirable skills and skills assessed in the interview process was placed on workplace skills, critical thinking, and resiliency. Their method of assessment in the interview process minimally focuses on discipline-related knowledge, but more so on

evaluating candidate responses to the organizational environment or simulated problem-solving activities. This notable absence of discussion of the skills most clearly developed in the classroom (discipline-specific skills) lends credence to the assumption that employers believe higher education effectively imparts those skills into recent graduates.

This assumption is supported by Sarkar, Overton, Thompson, and Rayner (2016), where employers described that recent science graduates possessed discipline-specific knowledge, but that “generic” skills (i.e., 21st century or soft skills) such as independent learning, problem solving, leadership, and initiative were most lacking in these recent graduates. Employers further believed that those generic skills were more indicative of workplace success than discipline-specific knowledge. This concept of under-preparedness for the workplace is supported by Tallentire, Smith, Skinner, and Cameron (2012) in a systematic literature review of studies of recent medical school graduates and their capability in working with acutely ill patients. More experienced colleagues rated the first-year doctors favorably regarding basic skills of assessment and resuscitation, but then described them as unprepared in addressing the complex problems and time sensitivity surrounding acute-care patients. In the current study, employer responses to the question of whether higher education effectively prepares recent graduates for the workforce mirrors those from the literature. When explaining why students are still unprepared, the common theme was their lacking critical thinking, resiliency, and workplace skills. Once again, discipline-specific skills were absent from conversation except for respondents who stated that recent graduates possessed discipline-specific skills to be successful as new hires in their company.

Students

Students experience the expectations gap as though an agreement exists between themselves and higher education whereby students will enter the classroom to gain knowledge and skills that will result in successful employment. More specifically, the institution has established colleges containing departments that employ skilled faculty who develop and administer curriculum under the supervision of the above bureaucratic layers. When students exit the classroom, the grade received for the course serves as confirmation of their success or failure to obtain those skills and knowledge. The results of this study highlight the expectation between the institution and students. Student participants reported in focus group sessions that the courses they took at the institution taught them critical thinking skills, resiliency, and workplace skills. Students also described they possessed workplace skills above the other concepts of critical thinking skills and resiliency.

This self-efficacy in the student population is mirrored by the Payscale (2016) findings where 87% of recent college graduates believed they were well prepared for full-time employment, while only 50% of managers felt the same. Davis (2010) found similar responses from recent college graduates where they experienced high expectations for success based on information received from faculty, but experienced ill-preparedness upon entering the workforce. Students in the Hart Research Associates (2015) study shared similar feelings of self-efficacy and held their colleges in high regard when asked about effectiveness. Students (74%) felt their colleges did a great job preparing graduates with the skills/knowledge necessary for success in the workplace and 64% were satisfied with their college's efforts to ensure graduates achieve learning outcomes necessary for

promotion in the workplace. Furthermore, even in skills/knowledge categories where students assessed their college preparation poorly, they still believed (at a higher rate than their employers) that they possessed those skills and were adequately prepared for the workforce. Like the Payscale study, 81% of employers believed higher education needed to improve in their ability to help students achieve cross-cutting skills and knowledge. Jackson (2012) supports these conclusions in a study of recent graduate versus employer skill perceptions. Students believed their capabilities much higher when it came to soft skills such as social responsibility, accountability, teamwork, and professional skill sets, but employers in the same study believed recent graduates were in fact lacking in these types of skills.

It is unclear whether this inflated self-efficacy of recent graduates can be attributed to generational differences in the workforce or an educational experience driven by the measurement of learning outcomes. Studies have attributed this overconfidence to characteristics of the millennial generation such as a lack of humility, positive self-regard, and an overly optimistic attitude in the face of a negative reality (e.g., quitting a good paying job in a recession) (Jackson, 2012; Stewart, Wall & Marciniec, 2016; Twenge, Campbell & Gentile, 2012). Twenge et al. (2012) raises the issue of higher education's contribution to this phenomenon by awarding students' good grades, although they may not have been earned, and awarding activity participation regardless of performance level. Stewart et al. (2016) and Arum and Roksa (2011) support this conclusion that there is nothing inherently narcissistic about the millennial generation, but when their educational experience reinforces this concept of successful learning outcome completion, they receive confirmation of their self-efficacy in these

areas, although employers report the opposite. Jackson (2012) offers a similar explanation away from generational differences and toward “pedagogical approaches and curricula content” that fails to appropriately challenge students.

Students in the current study displayed feelings of self-efficacy related to skill proficiency like the above-mentioned studies of recent graduates. Student participants experienced a false sense of self-efficacy evidenced by their responses to two separate questions. First, students felt they already possessed many of the critical thinking, resiliency, and workplace skills upon entering the college classroom. Faculty respondents believed the opposite to be true, often attempting to incorporate those skills into the classroom to supplement the ill-preparedness of these incoming students. Next, student participants responded that they possessed the critical thinking, resiliency, and workplace skills desired by employers. Upon comparing this to responses from the employer participants, students were viewed as deficient in these skills areas as well. While there may be generational implications to this misplaced self-efficacy, the more feasible explanation is that echoed by Arum and Roksa (2011), that students are not challenged in either secondary or post-secondary education; they equate success with grades on examinations and believe graduation from each institution correlates with skill proficiency.

Faculty

Faculty experience the expectations gap differently than the student and employer groups, where the former serves as an input to higher education and the latter receives the output from higher education. Faculty are utilized as tools or as an intervention that shapes the input into a desirable output for the employer. Faculty experiences multiple

expectation gaps related to secondary education, the bureaucratic nature of higher education and their administration of curriculum. One conclusion reached by faculty participants in this study is a consensus view of under-preparedness of students upon entering higher education. Students were described as lacking proficiency in critical thinking skills, workplace skills, or resiliency skills with the culprit ranging from a standardized testing culture to minimal academic freedom for secondary education teachers. One respondent described student unpreparedness for higher education this way: “It’s like they are trying to build a life raft as they’re in the water, and they don’t handle it well.” Arum and Roksa (2011) describe this lack of preparation both academically and behaviorally. One-third of college students have taken a remedial course, which occurs in a classroom environment that likely does not foster higher-level critical thinking skills or complex reasoning. Students entering college directly from their secondary institution are also less likely to have embraced the norms, values, and behaviors that would translate into an ability or interest to focus on rigorous academic instruction in a university setting.

Faculty in the current study described an effort to adopt non-traditional teaching styles for the purpose of incorporating these lacking skill sets into their curriculum, but the assessment of proficiency in these skills remained tied to traditional evaluation methods (e.g., standardized tests, essays, etc.). Higher education learning outcomes are designed to create a system of knowledge/skill evaluation and alignment with employer expectations provide minimal guidance, but sufficient restriction prevent faculty from redesigning curriculum based on their interpretations of student skill deficiencies. Caspersen et al. (2017) describes learning outcomes as influencers of curriculum creation

and classroom application, but the way in which this occurs, along with the outcomes, are unclear and potentially negative. Hadjianastasis (2017) found that among faculty participants, over one third were unsure or negative regarding the linkage between learning outcomes and assessment. Less than half the faculty respondents in the same study were confident that their students found learning outcomes useful. Gosling (as cited in Hadjianastasis, 2017) through learning outcomes and Jackson (2012) through rubrics describe a higher education environment that is transparent both in the skills students should be able to demonstrate and their proficiency level in those skills throughout their college career. Hadjianastasis (2017) cautions that learning outcomes in higher education should be used more as a guide to focus learning activities, not as inflexible, predictive evaluation tools. Hadjianastasis goes on that inflexible learning outcomes

serve the need to put everything regarding education in tidy little boxes with labels; they serve a spreadsheet bureaucracy which seems to operate with a Stalin-esque five-year plan mentality, based not on reality, but on the need to have a semblance of order. (p. 2254)

The current ineffectiveness of implementing and assessing learning outcomes is best summarized by former Stanford University provost John Etchemendy:

“Whenever we try to directly measure what students have learned, what they have gotten out of their education, the effect is tiny, if any. We can see the overall effects, but we cannot show directly what it is, how it is that we’re changing the kids” (Lederman, 2019).

Faculty find themselves in the middle of this larger higher education issue with limited guidance and input on how best to structure and administer curriculum based on

the skill deficiencies of those entering their classrooms. The efforts made by faculty are in no way standardized classroom to classroom, as teaching styles, content, and assessment criteria all differ. Unlike primary and secondary-level educators, university professors have not been formally trained in teaching styles that emphasize educational outcomes related to classroom expectations (Arum & Roksa, 2011). As faculty respondents in the current study demonstrated, their attempts to teach critical thinking skills, workplace skills, and resiliency skills involved a wide range of teaching styles and content such as in-class group activity, critical analysis of journals, applied learning activities with community partners, lab work, and Socratic lectures. A potential negative with this level of diversity in class content is student exposure relies on choice of major and, more specifically, choice of instructor.

Arum and Roksa (2011) offer a much less optimistic view of the potential of students to find the high achieving faculty member in the higher education environment. Faculty themselves have found their responsibilities increasing within the educational organization through administrative tasks such as committee participation and advising, resulting in less time for grading and instruction preparation. Another issue is the focus of faculty on career advancement and professionalization through tenure and scholarship, both of which place minimal emphasis on instruction. Students have grown less inclined to seek out the high achieving faculty members as they become more concerned with effectively managing their college workload as students dedicate increasing hours to nonacademic pursuits and seek out classes with lenient instructors and minimal reading or writing assignments, thereby creating an experience devoid of faculty interaction outside of the classroom and increased social interaction with peers (Arum & Roksa,

2011). Contributing to the ease at which students navigate their educational environment in this way is the minimal evidence showing that faculty (at least at the department level) collaborate on syllabus development to ensure courses are equitable in their difficulty and expectations related to reading, writing, and critical thinking (Arum & Roksa, 2011).

With the results of the current study and the supporting research, the issue becomes how to redesign curriculum and learning outcomes within higher education in a way that promotes faculty academic freedom, while at the same time ensures students acquire desirable skills competencies that are immediately demonstrable to employers. With this guidance, design thinking may serve the needs of both higher education administrators who plan curriculum at the macro-level across the university setting and faculty who implement the curriculum in the classroom. Design thinking could promote more collaborative, creative decision-making at the administrative level, allowing universities to customize curriculum based on student needs and remain flexible to the changing needs of the employer. The incorporation of design thinking into the classroom environment allows faculty the same level of flexibility based on their discipline, while also successfully incorporating critical thinking, resiliency, and workplace skills into their instruction.

Design Thinking Solutions

The design thinking concept is most capable of being adapted into higher education curriculum due to its similarity with how people learn in the natural world—i.e., trial, error, retrieval. In many cases, it already has been implemented in fields reliant on creative problem solving—e.g., engineering, business, education, law, and medicine (Schon, 1987; Simon, 1996). The incorporation of design thinking into higher education

curriculum and learning outcome redevelopment, as well as classroom instruction, seeks to address the secondary issues that have arisen in the current study, which compound in their contribution to the primary issue and overarching theme of the expectations gap between higher education and employers. Those conclusions will be discussed first before addressing the larger implications on the expectations gap. When discussing how design thinking in higher education can solve the issues presented by these conclusions and the larger expectations gap, the Stanford University d.School model of design thinking will be used (Figure 1, p. 16).

The employer group seeks a hiring pool composed of recent college graduates with proficiency in critical thinking, resiliency, and workplace skills. Although students believe they currently possess these skills in abundance, the opposite is true according to employers, but student participants acknowledged their importance and would undoubtedly want to possess critical thinking, resiliency, and workplace skills. Faculty observe these skill deficiencies in their students and recognize their importance to the employer group. Regardless of micro- and macro-level influences on faculty that currently prevent these skills from being transmitted in the classroom, this group is open to curriculum changes and learning outcome alignment that ensures their students possess these skills, while at the same time promotes faculty academic freedom and creativity in their course structure. Higher education should focus efforts on ensuring students engage in applied learning activities and group work inside the classroom to ensure the development of non-technical skills like teamwork, leadership, initiative, communication, and problem-solving (Cappel, 2001). Kuh, Kinzie, Schuh and Whitt (2005) describe four educational practices that can be satisfied through the incorporation of design thinking in

curriculum development and class instruction: academic challenge, active/collaborative learning, student-faculty interaction, and enriching educational experiences. Based on the Stanford model of design thinking education, faculty are an integral part of the education process, expected to integrate real-world problems or applied learning with community partners into the classroom setting. While faculty serve as a guide in the process, learning through design thinking is a student-driven endeavor meant to challenge participants to creatively solve problems, navigate barriers/roadblocks and collaborate with one another (Dunne & Martin, 2006), thereby satisfying recommendations from the literature (Arum & Roksa, 2011; Cappel, 2001; Kuh et al., 2005).

Employer respondents referenced the importance of experiential learning and the use of internships to promote those skill sets. Faculty respondents were incorporating applied learning activities into the classroom that utilized either community partners or real-world problems. While students did not speak specifically to applied learning opportunities, recent graduates in Davis (2010) discussed experiential learning opportunities as a possible solution to their deficiency in certain skills expected by their employer. Jackson (2012) and Cappel (2001) echo this call for greater involvement by industry in this quest for skill development through applied learning opportunities with the latter believing non-technical skills can only be developed away from the classroom in these applied settings. Proponents of design thinking in the classroom identify applied, experiential learning opportunities away from the traditional environments of textbook and lecture (Waks, 2001).

The argument put forth is that design thinking is a solution to both micro-level higher education issues such as course offerings and classroom instruction and macro-

level issues such as learning outcomes and curriculum planning. Although most widely adopted and integrated into design-based courses (e.g., engineering, architecture, computer information systems), design thinking has seen successful utilization in fields such as business management, leadership (Armstrong, 2016; Ching, 2014; Dunne & Martin, 2006), mathematics (Kim, Kwek, Meltzer, & Wong, 2013), and education (Aflatoony, Wakkary & Neustaedter, 2017; Carroll, Goldman, Britos, Koh, Royalty & Hornstein, 2010). There are arguments for the incorporation of design thinking into the medical field (Goodman, Schneeweiss & Baiocchi, 2017; Gottlieb, Wagner, Wagner & Chan, 2016) and social work/public administration (Brown & Wyatt, 2010; Mintrom & Luetjens, 2016). Disciplines utilizing design thinking in their coursework and instruction demonstrate some of the skill sets desired by employers such as creative problem solving, teamwork, empathy, resiliency, communication, applied knowledge, and project completion (Orthel, 2015; Rassuli & Manzer, 2005).

While most research and case studies focus on the design thinking implementation in the classroom, there are recent examples of educational institutions utilizing design processes at the macro level. One explanation for this is best described in Gardner (2017) where faculty and administrators from across the United States participated in a design thinking training at Stanford University. One participant described the major problem facing design thinkers in the higher education system as “coming back to a system that might not be designed for this way of teaching and learning.” Gardner (2017) goes on to highlight institutional issues such as academic reluctance to incorporate a decision-making process based on trial-and-error, concern over another in a long line of changing fads in higher education, and the continued

corporatization of the classroom. The successful utilization of design thinking inside of complex, diverse organizational environments is already evident in case studies of 3M, Toyota, and IBM conducted by Liedtka (2014). Even without large scale organizational change, companies such as Starbucks have utilized the design thinking process to understand their customer base. In response to the 2008 financial crisis, where the company experienced decline, store shuttering, and loss of market share, Starbucks reached out to customers to determine their needs and wants from the company, then created a strategy to incorporate them by testing and retesting store design concepts, menu offerings, and locations (Stinson, 2014). Whether embraced campus wide philosophically or implemented in administrative decision-making, the design thinking process could be just as beneficial to higher education institutions that have become less public service oriented and more market driven in recent years through competition for scarce resources, customers (students), and differentiation.

It can be argued that design thinking has already successfully found its way into some university departments and centers, if not entire colleges. Business programs creating entrepreneurship program tracks feature problem solving, product testing, assessment, and redesign, all analogous to the steps of design thinking. Denny, Durkin, Irwin, Moore and Toyer (2012) describe efforts to weave social enterprise into the University of Northampton as a mechanism to improve upon and fundamentally change higher education by focusing on values such as enhancing the student experience, social inclusion, social impact, innovation, change, and entrepreneurship. Globally, colleges have been designated “changemaking campuses” through the Ashoka Organization in their efforts to “shift higher education from traditional (e.g., slow to change, siloed, risk-

averse, hierarchical, rigid, bureaucratic) to more innovative and entrepreneurial (e.g., open to change, creative, collaborative, everyone contributing ideas)” (AshokaU.org). The Caledonian University in Glasgow has implemented a change process like design thinking, labelled *Carpe Diem*, in the effort to assist faculty and deploy a new learning management system university wide. Carpe Diem, like design thinking, features collaborative decision-making, teamwork, rapid design, and prototyping to create new courses, change existing ones, and transition face-to-face instruction to the online learning environment. Design thinking concepts are evident in the previous examples, whether through organizational decision-making processes or through the needs-based empathy building, collaboration, and creative problem solving of social entrepreneurship and changemaking.

If institutions of higher education seek to satisfy employer demand and ensure that students leave with proficiency in the skills of which they were promised, thereby closing the expectations gap among the groups, then higher education must adopt the same creative problem solving and resiliency skillsets it seeks to impart in the student body. As stated by former Stanford University provost John Etchemendy, “We need to worry less about the architectonic of how assessment works and worry more about whether we’re teaching what we’re trying to achieve, and is the design still a good design, or maybe times have changed” (Lederman, 2019).

Limitations

The primary limitation to this study involves the use of convenience sampling to select study participants. While non-probability sampling is an acceptable method for a qualitative study, the issue lies in drawing conclusions between the faculty, student, and

employer group responses. Student participants were selected by class, based on their instructor's amenability to allowing a study to occur during regular meeting time.

Although the classes were selected from general education courses to allow for diversity in the participant's field of study, an issue that arose was the presence of 1st-year through 4th-year students. For questions that focused on the skills possessed by students, it is impossible to determine if these skills were developed/under-developed during their high school education or during their time at the university.

Another limitation is the relationship between student and faculty groups. For this study, students were asked to discuss skills learned in the college classroom, but there is no way of determining whether those skills were learned in the classrooms of the sample faculty in this study. Without this relationship between groups, it is unclear whether faculty is truly transmitting and developing the skills from their responses and whether their students are successfully receiving those skills. The same limitation could be argued for the employer participants, as some had ties to the university where the students and faculty sample was drawn, all were describing recent college graduates as a general sample of their workforce, not those specifically from the university featured in the study. While these are limitations to this study that could be improved upon in future studies, the original design was to gain an understanding of faculty, students, and employers as three distinct groups as they described their understanding and approach to skills development in higher education.

Lastly, when addressing skill sets important to employers, no attempt was made to apply a weighting system to responses to rank them in order of importance. While this study was conducted to gain an understanding of whether participant groups aligned in

their opinions of employability skill sets, an additional layer to further that understanding could have focused on ranking and justification during the interview process, as featured in past research. The caveat to incorporating rank or weight to these skills lies in the diversity of student, faculty, and employer groups. For instance, problem-solving skills may be weighted heavier in applied disciplines such as engineering, while communication skills may be weighted heavier in customer-centered fields like commercial banking.

Implications for Future Research

Future research into this area of design thinking as a solution to the expectations gap should focus on institutions that have implemented design thinking into their administrative processes and course work. After review of the literature surrounding learning outcomes and assessment in higher education, design thinking may serve as a linking pin between diverse institutions and programs that have often struggled to standardize learning outcomes. While the literature supports design thinking in higher education as the mechanism to close the skills gap between recent graduates and employer expectations, future studies should follow those recent graduates throughout their first year of employment in a more meaningful way. Instead of simply tracking the employment rate, beginning salary or prestige of the companies in which recent graduates find employment, similar metrics from this study could be incorporated. Determining how students perceive their self-efficacy in their workplace and how their educational experience could better prepare them is beneficial, but aligning that information with employer feedback about skill proficiencies and expectations specific to recent graduates from a college or university would paint a more accurate picture of whether design

thinking was in fact closing the expectations gap between higher education and employers.

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APPENDIX A

Student Focus Group Questions

Student Focus Group Questions	Research Questions
Is there a difference between attributes and skills? What is that difference?	RQ3, RQ4
What attributes/skills do you think you possess?	RQ3
What attributes/skills have you learned in your university course work?	RQ2, RQ4
What are the top attributes/skills that will help get you a job when you graduate? Why?	RQ1
What attributes/skills do you think employers want?	RQ1

APPENDIX B

Faculty Interview Questions

Faculty Interview Questions	Research Questions
Is there a difference between attributes and skills? What is that difference?	RQ4
What attributes/skills do students have before they enter your class?	RQ3, RQ4
What attributes/skills do you teach in your coursework?	RQ2, RQ4
What exercises are used to teach students these attributes/skills in the classroom?	RQ2, RQ4
How do you measure proficiency in these attribute/skills?	RQ2
What attributes/skills do think employers are looking for in new hires?	RQ1, RQ4

APPENDIX C

Employer Interview Questions

Employer Interview Questions	Research Questions
Is there a difference between attributes and skills? What is that difference?	RQ3, RQ4
What attributes/skills do you look for in new hires?	RQ1, RQ4
Do universities prepare students with these attributes/skills?	RQ2
How do you assess whether potential hires possess these attributes/skills?	RQ4
What attributes/skills should students be developing in the classroom that would make them successful in your company?	RQ1, RQ4